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October 11, 2004

**VIA FedEx**

Mr. Gary Sanderson  
New Jersey Department of Environmental Protection  
Office of Brownfield Reuse  
401 East State Street, 6th Floor  
Trenton, New Jersey 08625

**RE: Former Ingersoll Rand Company Facility located at  
942 Memorial Parkway, Phillipsburg, Warren County, New Jersey  
NJDEP Case Nos.: NJD002395382 / 99685 / 2000050 / 2004306  
(ENSR Project Number 03710-162)**

Dear Gary,

Enclosed please find three copies of the Site History Report for the above-referenced site. As per earlier discussions with David Doyle and Maria Franco-Spera documented in ENSR's December 9, 2003 letter to NJDEP, this report has been developed to present a historic review of the facility portions of the property and document substantial compliance with the Preliminary Assessment portions of the Technical Requirements for Site Remediation since these investigations were initiated prior to July 1993. A Preliminary Assessment Report for the farm and undeveloped portions of the property was submitted in July 2004. Additionally enclosed for your convenience is a PDF version of this document on CD-ROM. If you have any questions, please feel free to call me at (732) 981-0200 or Dave Sordi at (860) 496-6290.

Sincerely,

Gregg R. Micalizio  
Project Manager

Christopher Venezia  
Department Manager

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enclosures:

cc: David Sordi, P.E. (IR)  
Aaron Kleinbaum (IR)  
Preferred Real Estate  
RT Environmental  
File 03710-Pburg-7.2/8.2

**Ingersoll Rand Company  
Woodcliff Lake, New Jersey**



**Site History Report  
Ingersoll Rand Company Facility  
Phillipsburg, New Jersey**

**(Electronic Document)**

**ENSR Corporation  
October 2004  
Document Number 03710-162-SHR**

### REPORT CERTIFICATION

The following certification shall be signed by the highest-ranking individual at the site with overall responsibility for that site or activity. Where there is no individual at the site with overall responsibility for that site or activity, this certification shall be signed by the individual having responsibility for the overall operation of the site or activity.

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this application and all attached documents, and based on my inquiry of those individuals immediately responsible for obtaining the information, to the best of my knowledge the submitted information is true, accurate and complete. I am aware that there are significant civil penalties for knowingly submitting false, inaccurate or incomplete information, and that I am committing a crime of the fourth degree if I make a written false statement which I do not believe to be true. I am also aware that if I knowingly direct or authorize the violation of any statute, I am personally liable for the penalties.

Typed/Printed Name Aaron Kleinbaum, Esq., P.E.

Title Assistant General Council and Director of Environmental Safety and Health

Signature *Aaron Kleinbaum* Date 10/4/04

Sworn to and Subscribed Before Me on this 4th

Date of October 10 2004

*Kathleen Vasquez*  
Notary

KATHLEEN VASQUEZ  
NOTARY PUBLIC OF NEW JERSEY  
My Commission Expires Oct. 15, 2007



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## 1.0 INTRODUCTION

ENSR Corporation (ENSR) has prepared this Site History Report on behalf of Ingersoll Rand Company (IR) for their former property located in Phillipsburg, New Jersey. The Report was developed in response to discussions with the NJDEP (specifically, Maria Franco-Spera, the former Case Manager, and David Doyle, Technical Coordinator). As discussed, the preliminary assessment activities conducted at the IR Site in Phillipsburg, NJ (Figure 1) were conducted prior to July 1, 1993 – the effective date of the Technical Requirements for Site Remediation (N.J.A.C 7:26E). This report has been prepared to summarize the site history and demonstrate that previously conducted activities were in substantial compliance with N.J.A.C 7:26E. These discussions were documented in ENSR's December 9, 2003 letter to NJDEP and are presented herein as a Site History Report.

This Site History Report was conducted for facility portions of the property only since this portion of the facility has been addressed in the Administrative Consent Order (ACO) and previously underwent historic review prior to 1993. The remaining farmed and undeveloped areas of the site required a full Preliminary Assessment, since they had not been previously addressed. A Preliminary Assessment Report for the Farm and Undeveloped Parcels of the Ingersoll Rand Company Site was submitted to NJDEP in July 2004.

To complete the documentation of this Site History Report pursuant to the most recent amendments to the Technical Requirements for Site Remediation, ENSR conducted the following.

- Review of site files including approximately 5,000 maps and historical drawings related to the site as well as available reports and correspondence relating to environmental issues (Appendix A provides an index of documents reviewed);
- Review of select documentation pursuant to N.J.A.C. 7:26E-3.1 et. seq. including
  - Historical aerial photos (Appendix B),
  - Environmental database report (Appendix C), and
  - Sanborn® Fire Insurance and Factory Insurance Association (FIA) Maps (Appendix D).
- Interviews with facility personnel; and
- Review of previously conducted environmental activities.

Due to the variety of information available, several inconsistencies were identified between documents reviewed for this report. Where possible, ENSR attempted to select the most conservative interpretation of the documents and remain consistent throughout this document. However, some inconsistencies remain in this report either to present differences in historical documentation, or to indicate that the discrepancy could not be resolved.

## 1.1 Background

Due to the presence of light non-aqueous phase liquid (LNAPL) discovered on the groundwater surface in 1974 during the installation of a production well, IR began investigation and remedial activities to mitigate the LNAPL impact. Through the 1970s and 1980s, IR installed a network of monitoring and recovery wells and installed a groundwater and LNAPL recovery system in 1986. In 1992 IR began conducting activities to identify potential Areas of Concern (AOCs) at the Site, specifically areas which had the potential to contribute to LNAPL impact. These activities included a review of site historic documents and aerial photos, interviews with site personnel, and physical inspections of portions of the site followed by investigative soil sampling and analysis. These investigations led to the discovery of 32 soil AOCs and four groundwater AOCs, which were detailed in the 1994 Draft Remedial Investigation Workplan (RIWP). A more detailed summary of these investigations is included in Section 2.0 and Appendix E. The historical review activities were not individually documented but were used in support of the 1994 Draft RIWP approved by NJDEP. Since these initial investigations presented in the 1994 Draft RIWP, IR has been continuing to conduct investigative and remedial activities which have culminated in the discovery of an additional 9 AOCs and NJDEP approval of No Further Action or conditional No Further Action for 25 AOCs.

In 2002, due to the underutilization of the property, IR began exploring redevelopment options. In effort to complete soil remedial activities, IR initiated an accelerated soil investigation at the Site which was designed to complete delineation of identified AOCs to the extent possible. During discussions with NJDEP regarding the proposed investigative plan, NJDEP indicated that a review of site history would be required to demonstrate that IR is in substantial compliance with the Technical Requirements for Site Remediation.

## 1.2 Objective/Purpose

IR has been in the process of identifying and mitigating impacts associated with previous operations since the mid-1970s. The objective of this report is to demonstrate that activities begun prior to July 1, 1993 have been in substantial compliance with Section 3.1 of the Technical Requirements for Site Remediation (N.J.A.C. 7:26E-3.1).

The goal of remedial activities at the site is to identify and delineate impacts across the property and address identified impacts in accordance with accepted methodology.

## **2.0 SITE OPERATIONAL HISTORY**

### **2.1 Original Site Use and Configuration**

Prior to 1903, the site was largely utilized as farmland. The facility area was divided into six subplots owned by Thomas McCormick, Jacob Feit, Paul Feit, John Feit, and Misses Feit. It is unclear whether or not residences were located on these plots prior to Ingersoll Rand's purchase in 1902. Properties adjoining those above belonged to the Colver family (to the south) and the Purcel's to the east, both of which would eventually be purchased by Ingersoll Rand in 1916 and 1940, respectively. However, these properties are largely part of the farm and undeveloped parcels of the property and are not addressed in this Site History Report.

Appendix F documents ownership records as compiled through our document review. A title and deed search was not completed. Table 1 presents a summary table of site structures and Appendix H provides a detailed review of historical records for each structure on the site.

### **2.2 Initial Construction and Facility Development Overview**

From the onset of production, the facility was administratively divided into five "divisions" that conducted various specialty activities. The Foundry Division operated steel, iron, aluminum, and brass foundries; the Drill Division conducted various rock drill manufacturing operations; the Compressor Division (later called turbo) manufactured and assembled gas compressors; the Cameron Pump Division, which began operations in 1913, manufactured various pumping equipment; and the General Division was responsible for facility operation and maintenance. This section details facility construction and development through the years of operation focusing on major changes to the facility. This section is largely based on a review of Factory Insurance Association maps, Sanborn Fire Insurance maps, an index of facility drawings, and select facility site maps. A summary table of site structures is provided in Appendix H and indicates building construction, modification, and demolition dates, where possible. Details regarding operations within divisions are presented in Section 2.3 and operations at individual buildings are detailed in Appendix H.

#### **2.2.1 Initial Construction (1900-1910)**

Planning and design activities began in the 1890's with completion of the first five buildings (#1 through #5) in 1903. These buildings comprised the Foundry Division which conducted metal casting activities to support IR's product line. Appendix G presents representative site maps from this period. As shown in this documentation, Building #3 (Cleaning Building) is located towards the northwest corner of the property with Building #2 (Pattern Storage) located south and Building #1 (Pattern Shop) directly south of Building #2. Building #4 (Foundry) was built east of Buildings #1 and #2. Building #5

(Carpenter Shop) was constructed east of the northern section of Building #4 (Foundry). According to the Legend of IR (Rodengen, 1995), the Foundry turned out its first casting on October 1, 1903.

Buildings #6 through #10 were completed in 1904 southeast of the Foundry area in the central portion of the facility area and appear to be related to General Division and Compressor Division operations. As shown on Appendix G, Building #6 (Office) was constructed east of Building #4 and southwest Building #5. Building #7 (Shipping and Painting) was constructed east of Buildings #5 and #6. Building #8 (Compressor Erecting Shop) is connected to the southern end of Building #7. Buildings #9 and #10 (Compressor Manufacturing and Erecting Shops) were constructed perpendicular and connected to Building #8 extending southward.

The remaining eight buildings (#11 through #18) originally planned for the site were completed in 1905 and are all located east of Building #7 (Shipping and Painting) and north of Building #8 (Compressor Erecting Shop). As shown in Appendix G, Buildings #11 and #12 (Engine House and Boiler House, respectively) were constructed north of Building #8 and east of Building #7 and were part of the General Division. The other structures, apparently related to the Drill Division, include Building #13 (Forge Shop), which is located north of Building #12; Building #14 (Tempering Building), which was constructed west of Building #13; Building #15 (Drill Testing), which is situated north of Building #14; Building #16 (Warehouse), which was constructed east of Building #15; Building #17 (Drill Manufacturing), which was constructed the furthest to the north and is connected to the northwest corner of Building #16; and Building #18 (Oil House), which was constructed east of Building #16.

All of the original buildings (with the exception of #1, #2 and #5) were constructed as steel frame on concrete slab with iron truss roofs and masonry exteriors. Buildings #1, #2 and #5 were constructed on concrete slabs with steel and wood frames, and plank roofs with masonry exteriors. Heating in these original buildings were reported to be hot water and/or steam generated by the Power House (i.e., Buildings #11 and #12), which was coal-fired. Fuel oil was reportedly used at Building #4 to fire two brass melting pots.

As shown in FIA maps included in Appendix D, five small pentagonal structures (Fire Hose Houses) are present on the site along with a water tower between Buildings #8 and #11. Several scrap bins were also present and included Shaving Bins located east of Building #10, Shaving and Scrap Bins east of Building #17, Scrap Bins (later identified as Building #59) southeast of Building #16, a Miscellaneous Storage Shed southeast of Building #18, and a stable and storage shed between Buildings #5 and #6. Concrete storage bins (later identified as Building #77) for coal, sand, and clay were also located just east of the Foundry (Building #4) and appear to be constructed in the side of an embankment with a rail trestle on top. At least six temporary storage sheds were also identified on the 1903 Sanborn map that was not repeated on later maps.

Railroad tracks, spurred from the Delaware Lackawanna Railroad located adjacent to the site on the west and north, entered the property at the southwest corner and provided rail services to many of the facility buildings as shown in Appendix G.

To supply water to facility operations, a production well was installed in 1903 between Buildings #8 and #11. An early facility map (see Appendix G) shows the presence of a water tower at this location. To supplement on-site water supply, the facility also received water from the Lopatcong Water Company, a wholly-owned subsidiary of IR until 1974. An on-site concrete-lined reservoir was completed circa 1905 in the southeast corner of the facility buildings with earthen embankments on the southern and eastern sides. This pond originally supplied facility operations with process and cooling water for the Boiler House (Building #12) and accepted stormwater and non-contact cooling water. Water supplied to the site by the onsite potable well and from the Lopatcong Water Co. was directed into the facility's combined potable water and fire suppression system plumbing.

A subgrade utility tunnel (referred to as the "Subway") was also present between many buildings to provide, steam, hot water, electricity, etc., from the Power House (Buildings #11 and 12). Subgrade fuel oil lines are anticipated to be present at this time; however, no indication of their existence was shown on period maps.

### **2.2.2      *Development in the early 1900s (1910-1920)***

In 1909 Ingersoll Rand acquired the A.S. Cameron Steam Pump Works and in 1911 began construction in the southwestern portion of the site to provide new facilities for the acquisition. The original Cameron Pump Division was completed in 1912 and consisted of Buildings #251A and #251B (Boiler House and Engine Room, respectively were part of one larger structure), Building #252 (Main Building), as well as a garage, a few sheds, and three hose houses (*Legend of IR*, 1995; Map: FIA #1180, 1922). A Scrap Bin and Pump House were also located in the Cameron Pump Division adjacent to the Main Building on its northwest corner. This portion of the facility was connected to the "peoples" city water main in Phillipsburg to the west as well as to the combined facility water system on the east.

Through 1913 other parts of the site also went through multiple additions and rearrangements. In the Foundry Division, four buildings were constructed for flask and obsolete pattern storage (Buildings #E, #G, #H, and #I; Buildings #G, #H, & #I were later identified as #74, #75, & #76, respectively) along with a horse stable located northeast of Building #3 (Cleaning), which was extended to the north during this period. Additionally, two smaller buildings appear northeast of Building #4 and are identified as Winch Room (Building #71 or #T) and Forge Shop (later identified as Building #U). Facility documents indicate that a mine, used to test rock drills and other mining equipment produced at the site, was in progress at this time near these buildings. South of the foundry, Building #L (Lumber Shed; later identified as #87) appears. Also, to the east of the foundry, Building #67 (Locomotive Crane; also #R) was constructed (FIA #698, 1913; Map #MD1090, 1947; and Map #94071, 1917).

Toward the central portion of the site, Building #19 (Shear Shop) was added between and connecting Buildings #16 and #13. Facility records also indicate that a bulk storage tank was added during the 1910's and initially identified as Building #79. West of Building #17, Buildings #20 (Hammerdrill/Machine Shop), #21 (Hardening), and Building #22 (Stone Building) were constructed. A new Scrap Bin appears north of Building #13 along with a Pickling Shed approximately 250 feet to its north. To the east of the new Scrap Bin, two 8,000-gallon USTs are present. To the east of Building #17, Building #23 (Annealing Dept or Quench Oil Pump House) appears in the 1916 Sanborn map as a small rectangular structure east of Building #17. Building #57 (Acetylene Generator House) was constructed northeast of Building #23. At some time in the late 1910's Building #18 was demolished and a new structure associated with the bulk AST (#79) was constructed as Building #18. To the north of Building #17, Building #M (Machinery Storage) was constructed. South of Building #17, additions appear to have been constructed at the east end of Building #13 and between Building #15 and Building #17; the latter of which was identified as oil mixing and cylinder building (FIA #698, 1913; Map #MD1090, 1947; and Map #94071, 1917).

Towards the south, in the Compressor Division, it appears that Buildings #9 and #10 each had 200-foot additions constructed to extend the buildings southward. A Compressor Manufacturing building (later identified as Building #34) was constructed between the older sections of these buildings. An Oil Room was also identified at the southern end of Building #10. Additionally, Building #25 (Forging Department) was added to the eastern end of Building #8 and an extension was added to the western side of Building #7 (FIA #698, 1913; Map #MD1090, 1947; and Map #94071, 1917).

Based on a 1917 site map, it appears that IR may have constructed employee housing on the northern portion of the facility property east of the main entrance. Housing would have been arranged in two rows of 23 or 24 lots measuring 25' by 100' each. It is unclear whether these structures were built and how long they remained on site as no other documentation reviewed confirmed their existence. Water was apparently provided to each house from a connection to the main water supply from Lopatcong Water Co. Also present in this area of the site were a General Store, Mess Hall, Bunker, and Washroom, (Buildings #40 through #43) along with a Water Closet (likely a restroom facility), all of which were located southwest the housing units.

By the late 1910's, several additional structures were identified across the site and included Building #26 (Employment Office), Building #27 (Hospital/Dispensary), Building #28 (Pump House), Building #29 (Locomotive Shed), Building #32 (Paint and Pipe Storage Shop), and Building #68 (Oil-mixing House), all of which were added to the eastern portion of the site. Two garages (Buildings #24 and #36) were present on the west and north sides of Building #20. Other changes included an addition to the southern side of Building #6 and Building #87, which may have been constructed in the early 1910's, was reclassified from a "Gun Club" to a "Seed House" (FIA #698, 1913; Map #MD1090, 1947; and Map #94071, 1917).

During these early years of operations, it is apparent that coal was relied upon as the dominant fuel source to power operations. Based on early maps and photographs, an approximately 240-foot long coal trestle (later identified as #88) was present on the eastern portion of the site and many buildings had associated coal sheds. It appears that coal was predominantly delivered to and transported on the site by rail car.

Factory Insurance Association and Sanborn Maps are included in Appendix D. Representative maps of the facility during the 1910s are included in Appendix G.

### **2.2.3     *The 1920s (1920-1929)***

During this period, multiple structures were added to each of the operating divisions as follows. Maps representative of this period are provided in Appendix G. Factory Insurance Association and Sanborn Maps are included in Appendix D.

Beginning on the western side of the facility, Buildings #J and #K (Obsolete Pattern Storage; later #89 and #85, respectively) were added in the foundry area near the previous pattern storage structures and a 9,000-gal UST was placed between Buildings #G and #I along with a reel house (Building #A), which was present south of the UST and southwest of #J, and a garage located east of #K. Building #30 (Casting and Cleaning) was constructed north of the Foundry (Building #4), which appeared to have several additions constructed. Later, Building #30A (addition to Building #30) was constructed in the area between and connecting Buildings #4 and #30. Building #51 (Dust Collector) was constructed south of Building #30A, and Building #50 (Generator House) was added southwest of Building #30A. Building #33 (Brass Foundry) was constructed southwest of Building #3 (which is now identified as a Brass Foundry) and west of Building #J. Building #N (Pattern Storage), which was originally constructed sometime between 1913 and 1922 north of Building #2 and west of Building #30, appears to have been relocated in the mid-1920s to the south side of Building #4 when an addition was constructed on the north end of Building #2. Additionally, Building #F (Lumber Storage; later identified as #73) was constructed south of Building #4 and southeast of Building #L. An eight-foot wide and 12-foot long Reel House (Building #52) was constructed southwest of Building #4 with an incinerator located to its west. The Forge Shop (Building #U) appears to have been demolished by 1926 and a Mine Hoist building (#81) was constructed about 10 feet northeast of the previous shop (IR Map, Undated; FIA #698, 1922; and FIA #698, 1926). By the end of the 1920's the Mine Hoist building was identified as Building #81 (Sharpener). A Gas Tank (#80) was added southeast of Building #N and west of Building #6 (Map #MD240, 1924). Based on facility records, it appears that the tank was part of the natural gas utility on site; no additional documentation regarding this AST was available.

Towards the east, in the central portion of the facility, Building #22-A (Testing Shed) appears north of Building #22 and a new Scrap Shed appears east of that. A new Building #22A was later constructed between Building #20 (Machine Shop) and Building #22 and the former Building #22-A was renamed Building #37 (Drill Testing). Building #84 (Lumber Shed) was observed during this time north of

Building #20 and northeast of #22. A guard house (Building #98) was also identified north of Building 22-A. South of the Scrap Shed appears two 10,000-gallon fuel oil USTs and an associated fuel oil pump house are present adjacent to the covered platform addition of Building #21 which extends eastward. Building #21, which was previously utilized for hardening processes shifted use to a carpenter shop, tin shop, and die staging area (FIA #698, 1922; and Map #MD240, 1924). East of this area a Wheel Barrow shed (which was demolished in the late 1920s) and an extension/annex of Building #17 (Building #17A) was present. Northward, Construction Shed #C (later identified as Building #38), and Stable #P (later identified as Building #38) were also present near Storage Shed #M. It appears that both Building #C and #P were later identified as #38 when an addition connected them creating one larger structure.

On the eastern side of Building #17, a Testing Building #W (later identified as Building #60) appears south of the Pickling Shed along with an Oil Purifying building attached to the eastern wall of Building #17. Farther east, Store Shed #O (later identified as Building #63) appears south of Building #23, which appears to have had several small additions as well as the construction of a generator house to its northeast. Building #58 (Tar Paper Storage Shed) was constructed south of #23 (Quench Oil Storage).

North of Building #17, FIA maps (FIA #698, 1926; and Map #MD240, 1924) indicate that buildings #40 through #43 (Store, Mess, Bunk, and Wash Room) appeared north of Building #C (Construction); however, other facility records indicate that they may have been constructed as early as 1917 along with the employee housing at the northern border of the property.

South of Building #17, Buildings #12, #13, and #14 appear to have had additions constructed. South of Building #14, two quench oil USTs appear beneath a "cooling shed" with a third UST southward and an Acetylene House to the west. A Wash House was observed east of Chip Bins (now identified as #59), which were located east of Building #16. Further southward, an addition appears to have been constructed at the north end of Building #13, east of which appears three 8,000-gallon fuel oil USTs. Westward, additions appear to have been completed on Buildings #6 and #7. Building #35 (Garage) was added west of Building #6 (FIA #698, 1922; FIA #698, 1926; and Map #MD1090, 1947).

At the southern portion of the facility, three sheds appear to have been added to the Compressor Division south of Buildings #9 and #10: Building #PS-1 (Shed; later identified as Building #53), Building #PS-2 (Shed), Building #PS-3 (Pipe Storage), and a separate unidentified storage shed (later known as Building #54). In the late twenties PS-2 and PS-3 were demolished when an extension to Building #9 was constructed. An addition was also constructed to the east end of Building #8, adjacent to the north side of Building #25 (forging shop) (FIA #698, 1922, FIA #698, 1926).

In the Cameron Pump Division, the only discernable changes in the 1920s included the addition of a small casting storage shed and the reworking of the internal layout of the Building #252 (Main Building) (FIA #698, 1922).



#### **2.2.4     *The 1930s (1930-1939)***

During the 1930s, several new features were identified on historical records. Factory Insurance Association and Sanborn Maps are included in Appendix D. Appendix G includes representative maps from this period.

On the western portion of the Site, Buildings #64 (Foundry Gate House) and Building #65 (Water Closet) were constructed near the Roseberry Street entrance (FIA #698, 1933; and Map #MD1090, 1947). In the Foundry area, several small additions appear to have been constructed at Building #33 and Building #E (Flask Storage) appears to have been demolished (Aerial Photo #129, 1939). Additionally, facility documents indicate that portions of Building #3, previously classified as a brass foundry, may have been used for pickling operations in the 1930s.

To the south of the Foundry, southeast of Building #N near AST #80 (Natural Gas Tank), two small sheds (Quarry Shed and Trigger Shed) appear in the 1930s. To the east of these sheds, additions appear to have been constructed at Building #6 and Building #26 (School; previously identified as Employment Office), which has been redefined as the plant old school (FIA #698, 1933; and Map #MD1090, 1942).

Northward, in the Drill Division, the scrap bin previously located to the north of Building #61 (previously identified as Building #V or the Pickling Shed) and west of Building #17 no longer appears and has been replaced with Building #83 (Casting Staging Building and Oil House). A 10,000-gallon cutting oil UST appear to have been located just north of this new building. Building #82 (Commercial Drill Test) appears to have been added the south of Building #60 (previously identified as #W). Additions also appear to have been constructed at Buildings #M and #38A to the north of Building #17 (FIA #698, 1933; and Map #MD1090, 1942). Facility records indicate that a Pump Testing House was constructed southwest of Building #18 and southeast of Building #68 and that a Transformer Yard was present east of the Power House (Buildings #11 and #12).

Southward, In the Compressor Division, a Bolt Storage Shed (identified as Building #53) was constructed south of the staging bins located south of Building #10. Building #PS-1, also located south of Building #10 was identified as Building #53. It is unclear from facility documentation if these buildings are the same structure or separate.

In the Cameron Pump Division, new construction included Building #257 (Erecting Building), which was connected to the north side of the Main Building (Building #252); Building #258 (Test Pit), which was added to the north side of Building #257; Building #259 (Office Building), which was constructed west of Building #258; a Garage (Building #260), which was located west of Building #252; Building #261, which was located west of Building #252 and was labeled as a Storage Shed, Heat Treating, and Casting & Cleaning Shed; and Building #263 (Gas Meter House), which was located south of Building #260. Records indicate that Building #66 (Guard House), located east of Building #258 and

Building #69 (Railroad Scale) located south of the Guard House were also constructed in the 1930s (FIA #1180, 1933; and Map #MD1090, 1942). Other additions include a Brass Casting Shed (Building #256) located north of Building #261; a Bar Steel Storage Shed located west of Building #252 and east of the Brass Casting Shed; and a Saw Shed southwest of the Bar Storage Shed.

Facility records indicate that a second production well (WW-2) was installed in 1934 at the northwest corner of the spray pond, presumably to provide additional water to the facility. Additionally, throughout the 1930s, it appears that small garden plots were developed in the northeast corner of the site. In 1939, the first overhead aerial photograph on record was taken and appears to show the presence of a previously unidentified pond east of the Spray Pond. A review of available aerial photos is included in Appendix B.

### **2.2.5     *The 1940s (1940-1949)***

In the 1940s, several changes in structure and use of buildings were identified on historical records. Appendix G presents representative maps from this period. Factory Insurance Association and Sanborn Maps are included in Appendix D.

On the western portion of the facility, in the Foundry Division, several small additions appear to have been constructed on Buildings #3, #4, and #33. Building #51 located west of Buildings #4 and #30 appears to have been demolished in the early forties. The Guard House (Building #64) and the Water Closet (Building #65), at the Roseberry Street entrance were demolished in the late forties and it appears that a parking area was placed in that area. Another parking area appears to have been placed northeast of the pattern storage buildings near the northern site border. In the mid forties a transformer yard, which was previous located east of Building #4 (Foundry) appears to have been moved northeast of Building #4 (Map: Extension to Foundry Yard, 1945). Also, it appears that four or five ponds were constructed in the 1940s (or late 1930s) on the western portion of the facility, three of which appear to be located to the west of Buildings #3 and #33 and appear in the depression east of the property boundary. The other two ponds were located southwest of Building #1 and, according to facility records, were inverse ponds, (Aerial Photo #289 2644, 1951; IR Directory of Buildings, 1958). Based on differences between the 1939 and 1951 aerial photographs, it appears that the "gas tank" AST south of the foundry is no longer present. Earlier photos show this tank partially buried. It is unclear if the tank was removed or completely buried in the 1940s.

Eastward, and north of Building #17, Building #89 (Truck Garage), and Building #39 (Storage), appear to have been added near Buildings #M and #38. Building #90 (Drill Storage) appears northeast of Building #17 with Building #85 (Crane) constructed south of Building #36 (Garage) and northwest of Building #22 (Experimental Testing; formerly "Stone" Building) (Map #MD1090, 1942; Map #MD950, 1940; and Aerial Photo, 1951). Additionally, a Bus Station (Building #99) was added south of Building #24. A second bulk AST (#100) was constructed southwest of Tank #79 (Building #79); and three 10,000-gallon above ground oil storage tanks east of Building #13 appear as Building #104. Building

#103 (Storage) appears during this time east of Building #10 and west of the Spray Pond. It also appears that the Guard House (Building #98) located north of Building #22 was demolished in the mid forties. (Map #MD1090, 1947; Map #MD950, 1940; and Aerial Photo #289 2644, 1951). Also, Building #11 (Engine Room), has been re-designated Building #12E (Engine Room) and a new Building #11 (Compressor Assembly) was constructed west of Building #9 and south of Building #8. Buildings #91 (Babbitt Building), Building #105 (Shot Blast Cleaning Shed), and Building #55 (Cut-Off Bins) have been constructed to the south of Buildings #9 and #10 (Map #MD1090, 1942; Map #MD950, 1940; and Aerial Photo, 1951). Building #53 (Pipe Shed), Building #54 (Storage/Casting Shed), and Building #55 (Cut-Off Bins) appear to have been removed from the south end of Building #10. Farther eastward, beyond the Spray Pond, it appears that two large ponds are present along with some smaller bodies of water. Facility records indicate that the two larger ponds are the Inverse Ponds and the smaller ponds are sinkholes.

In the Cameron Pump Division, a Pump Manufacturing Shop (new Building #253) was constructed off the northeast section of Building #252. Buildings #253 (Garage), #256 (Brass Casting), and #255 (Bar Storage Shed) appear to have been demolished during the 1940s. Additions were constructed at Buildings #252 (Main Building), #257 (Erecting Building), #258 (Test Pit), and Building #261 (Storage). Building #251A, previously identified as an Engine Room appears to have become a Maintenance Shop and Building #262, originally identified as an extension of Building #261 appears as a separate building located southwest of Building #261 (Map #MD1090, 1947; Map #MD950, 1940; Aerial Photo #289 2644, 1951; and IR Directory of Buildings, 1958).

#### **2.2.6     *The 1950s (1950-1959)***

In the 1950s, several changes in structure and use of buildings were identified on historical records. Appendix G presents representative map from this period. Factory Insurance Association and Sanborn Maps are included in Appendix D.

The western portion of the parking area at the Roseberry Street entrance appears to have been enlarged and improved throughout the 1950s. The two "Fire Ponds" along the northwestern boundary appear more distinct throughout the 1950s and appear as if they had been enlarged. In the Foundry area, Building #60 (Radiograph) was constructed west of Building #3 (Brass and Aluminum Foundry) and Building #80 (File Storage) appears to have been added between buildings #30 and #22. Additions were constructed at Buildings #2, #4, and #30 during this decade along with the placement of an oxygen tank west of Building #H. Landscaping and roadway changes were also made in the foundry area in the 1950s and include the extension of the northern parking area to the site boundary. Additional parking was added late in the 1950s north of Building #17 along with a Gate House (Building #92) south of the parking lot, and a garage at the southwest corner of Building #89. Additionally, Building #37 (Drill Test) was demolished in 1952 and a new Building #37 was constructed slightly north of its previous location, Building #87, formerly a Gun Club and Seed House, now appears labeled "Garden House", and an incinerator appears present to its west.

Southward, Building #102 (Receiving Platform/Office) was constructed on the north side of #17A along with a Truck Scale House (#45). Additions appear to have been built at the Cafeteria (Building #5; formerly "Carpenter Shop") and Hospital (Building #27). West of Building #17, pickling shed (Building #61), and testing shed (Building #60) appear to have been demolished and Building #61 (Wagon Drill Storage) was added. East of Building #83, Buildings #62 (Storage), #23-C and #23-D appear, with the latter two structures replacing two small sheds that were formerly located north of Building #23. Building #16, located just south of this area and formerly identified as a warehouse, has been re-designated as the Masterdrill Assembly Building and an addition was constructed on its eastern side. Further, additions to Buildings #7 (#7E), #8 (#8B, #8C, and #8E), and 14 (#14B) are apparent. Several new storage bins also appear in the late 1950s at the southeast corner of Building #10.

Continuing southward, in the Compressor Division, Buildings #9, #10 (#10A, #10B, and #10D), and #34 appear to have undergone minor additions. Building #56 (Air Facilities Test Building) was constructed south of Building #103 with an incinerator located to its southwest near a newly placed lumber storage yard. South of Building #10, a steel storage building appears to have been constructed in the former location of Building #53 (shed). To its west a new sandblast building appears to have been added in the 1950s. Further south, a bunk house for railroad crew (Building #64) appears to have been built southeast of a new Railroad Scale (Building #69).

In the Cameron Pump Division, additions were constructed on Buildings #257, #258, and #262 and a crane way was added to the south side of Building #252. It appears that the Gasoline Test House (Building #263) had been relocated (FIA #1180, 1960; and IR Directory of Buildings, 1958).

### **2.2.7     *The 1960s (1960-1969)***

Based on facility records, it appears that only few major alterations in site configuration were conducted throughout the 1960s. Appendix G presents representative maps from this period.

On the western portion of the facility it appears that no significant changes were made until the mid-to-late 1960s, when Building #106 (Pattern Storage) was constructed on the west side of Building #2 and a large addition was constructed at the northwest corner of Building #3.

East of the Foundry, it appears that an addition was constructed on the northern side of Building #17 (Building #17A) and some site work appears to have extended parking areas in the area to the northern site boundary. A truck scale (Building #45) was formerly present where Building #17A was placed. Southward, no significant changes occurred to the main grouping of buildings except for the addition of Building #65 (Air Facility), which was constructed off the northwest corner of Buildings #56. Building #66 (Gas Power Development) was constructed south of Building #5. Eastward, a new bulk AST (#43) was added to the two previously present ASTs.

In the Cameron Pump Division, Building #254 (Storage) was constructed to the east of Building #252 and west of Building #253. Building #255 (Bar Storage) was constructed south of Building #262. Also, an addition was constructed at Buildings #258 and #259 to connect the two.

### **2.2.8     *The 1970s (1970-1979)***

Through the 1970s several changes in structure and use of buildings were identified on historical records. Appendix G presents representative maps from this period.

On the western portion of the Site, the foundry area appears to have undergone several changes throughout the 1970s. Buildings #67 (Storage), #71 (Mine Hoist), #72 (Mine Shaft), #80 (File Storage), and #81 (Training Building) were demolished during this time and Building #101 (Foundry Office), Building #3 (Foundry), and Building #4 (Foundry), had constructed additions. It is believed that the experimental mine was abandoned at this time; however, no documentation was identified to confirm how the mine was abandoned. East of Building #3, another Storage Building (#107) was also added. West of Building #33 (Casting and Cleaning), Building #47 (Propane Facility) was constructed and Building #41 (Propane Tank) was installed south of Building #4. The pattern storage buildings were renamed during the seventies: Building #H became Building #75, Building #K became Building #85, building #I became #76, Building #G became Building #74, Building #J became Building #89, Building #N became Building #58. The lumber storage buildings were also renamed: Building #F became Building #73 and Building #L became Building #87 (Map #MD 3206, 1977; Map #MD 3010, 1976; and Map #MD 950, 1940 rev. 1972). Additionally, one of the two small ponds present southwest of Buildings #1 and #4 appears to have been filled.

Eastward, Buildings #24 (Garage), #35 (Garage), and #36 (Garage) have been demolished. Building #99 (Bus Stop) has been demolished and the building number has been reused on a structure located at the northeast corner of the property. Building #37 was also demolished in the 1970s and replaced with a new Building #37 (I.R.T.O. Truck Terminal) towards the northeast corner of the site. Other new structures include Buildings #53 (Truck Shed) and #99 (Security Gate 26), which were completed south of the I.R.T.O. Truck Terminal. Buildings #58 (Tar Paper Storage), #87 (formerly Gun Club, Seed House, and Garden House), and #89/89A (Truck Garage) also appear to have been demolished in the late 1970s.

Southward, storage buildings #58 and #61 formerly located between Buildings #17 and #23 appear to have been demolished. Building #22 (Pump Testing) and Building #21 (Maintenance) appear to have been connected and has been renamed Building #21 with the former Building #22 renamed to #21 after an addition connected them. East of Building #17, Buildings #56, #65, and #103, formerly located just west of the Spray Pond were all demolished and new Building #24 (Testing Building) was constructed east of Building #10. Continuing southward, a new Sand Blast Building was added between Building #11 and #9.

The filled area south of the main buildings changed significantly during this decade with altered topography, different rail and storage configurations, as well as the short-term presence of nine large objects, possible storage sheds, contained within a soil berm toward the southern portion of the Site. Appendix L discusses the progression of filling activities at the site in detail.

During the 1970s it also appears that another bulk AST, identified as Building #79, was installed northwest of the former Tank #79, which now appears as Building #86 (Water Tank). It is unclear from facility records whether the former Tank #79 was demolished and replaced with Tank #86 or if the tank was just renamed. With the presence of a new water tank, the Water Tower, located north of Building #8 and previously identified as #86, was demolished. The containment structures around each of the ASTs were also changed from a circular containment berm around each tank to what appears to be a single containment structure around the three western tanks. No containment appears to have been present at Tank #86 by the late 1970s, which is consistent with its use as a water tank. Southward, the former Coal Trestle (Building #88) appears to have been demolished some time in the 1970s along with several of the small ponds previously identified east of the Spray Pond as sinkholes. By 1981, it appears that only the two current ponds remained in this area. Additionally, it appears that the Spray Pond was reconfigured.

At the Cameron Pump Division area, a new Paint and Oil Storage Building (#264) was added on the east side of Building #253. Additions also appear to have been constructed at Buildings #257 and #258.

### **2.2.9     *The 1980s (1980-1989)***

The 1980s represented a large change in operations and activity at the site with the addition and removal of many structures. Appendix G presents representative maps of the facility during this time.

The western side of the Site was the location of many activities during the 1980s in support of the closing of foundry operations. Specifically, Building #4 (Foundry), Building #30 (Brass Foundry/Casting & Cleaning), and Building #107 (Pattern Storage) were demolished along with many of the pattern storage and lumber storage buildings including Buildings #41, #47, #58, #73, #74, #75, #76, #85, #87, and #89. The two Fire Ponds previously present at the western boundary appear to have been replaced with a single stormwater detention basin and the parking area at the Roseberry Street entrance was removed. During the 1980s, the Roseberry Street entrance appears to have been reconfigured and much of the former parking area south of the foundry has been removed. Additionally, the pond, formerly present southwest of the Foundry appears to have been filled during this time.

Eastward, at the northern end of the facility, all of the remaining Buildings north and west of Building 17A appear to have been demolished. These include Buildings #21, #38, #39, and #40. In 1980, the structures east of Building #17 were razed for the construction of Building #17B. Structures removed

included Buildings #61, #83, #90, and #57. By the end of the 1980s Buildings #23, #62, and #82 had also been removed along with Buildings #14, #15, and #17, the latter of which was paved over to become a new parking area. West of the main buildings, Building #32 was demolished along with the bulk of Building #6 (only a portion of the substructure was left). East of the main buildings, it appears that a structure (Building #104) was placed at the site of three ASTs and above-ground piping was installed connecting these tanks to the bulk ASTs to the east and the facility (Building #16) to the west. Also the storage area and incinerator located northeast of Building #17A was removed. Facility records indicate that a helipad was permitted and installed just east of this area in the late 1980s or early 1990s.

To support continuing Pump Assembly operations, which were moving from the Cameron Pump Division area into the remaining buildings at the main facility area, new Building #22 (Pump Test) was constructed at the southwestern corner of the Spray Pond.

Due to declining operations within the Cameron Pump division structures, several were demolished through the 1980s including Buildings #251, #259, #260, #261. Remaining Cameron Pump division buildings were demolished in the early 1990s.

#### ***2.2.10 The 1990s and present (1990-2004)***

During the 1990 and early 2000s, operation continued to decline at the facility until 2000, when a partnership between Dresser and IR was dissolved and the business was sold to Flow Serve Corporation. During this time only few changes were made at the facility. A map representative of this period (i.e., current conditions) is included in Appendix G0.

On the western portion of the facility, no significant changes were observed except the condition and configuration of some of the paved roads. At the northern portion of the site, the parking areas east of the foundry and west of I.R.T.O (Building #37) were removed and covered as well as the old storage and incinerator area northeast of Building #17A. Additionally, the road configuration was changed at the Memorial Parkway (northern) entrance and a new guard house was constructed.

Building #5 (General Office), Building #55 (Steel Room), Building #91(Storage), and Building #105 (Shot Blast) were demolished in 1997 and placed in the New Landfill, which is located to the west of the Old Landfill and east of the Cameron area. The history of the onsite landfills are included in Appendix L and not presented in this section of the report.

At the time of this writing, the following buildings remain on site.

At the western portion of the facility, the stormwater detention basin is present along with former foundry Buildings #1 (former Pattern Shop), #2 (Pattern Storage), #3 (former Steel Foundry), #33

(former Aluminum and Brass Foundry and Casting & Cleaning Bldg.), #60 (former Radiograph Building), #106 (Pattern Storage), and #107 (former Pattern Storage).

Eastward, Building #101 (Sales Office) and Building #20 (General Office) are present. Northward, the Main Security Building is present and Building #37 (former IRTO Terminal) remains at the northeast corner of the Site with a Security Booth present to its southeast. Southward, in the former Drill Manufacturing area, Buildings #17A (Storage) and #17B (Test/Storage) are present. Farther south, Building #63 (Maintenance Truck Garage), Building #16 (former Assembly/Test), Building #15 (former Drill Testing), Building #7 (Test/Office), Building #19 (former Office), Building #13 (former Machine Shop/Test), Building #29 (former Locomotive Shed), a Hazardous materials storage shed, and Building #12 (former Powerhouse) are present. West of Building #7, Buildings #27 (former Dispensary), #6 (Telephone Room), #26 (former Training Bldg.), and a Security Booth are present.

Southward, in the former Turbo/Compressor Division area, Buildings #25 (former Forge Shop, Blower Test and Assembly), #8 (Assembly and Test), #9 (former Machine Shop), #10 (former Machine Shop), #11 (former Machine Shop), #34 (former Tool Room/Office), #36 (former Sandblast Facility), #23 (former Annealing Dept, Sandblast and Jackbit Mfg, and Clean Room), #24 (Turbo Test Building), #66 (Test Development Lab), and a Hazardous Materials Storage Shed are present.

On the eastern side of the site, the four bulk ASTs – Building #86 (Water Tank), Building #79 (Oil Storage Tank Building #100 (Oil Storage Tank), and Building #43 (Oil Storage Tank) – are present along with the Air Stripper Building, Building #111 (Gas Compressor House), Building #110 (Pump House), Building #18 (Foam House), and Building #70 (former Pump House). Southwest, Building #104 (Oil Storage Tanks/Oil Water Separator), a Salt & Sand Shed, a Transformer Yard, Building #35 (former Chlorinator Shed), Building #28 (Pump House), Building #78 (Spray Pond), and Building #22 (pump test pit) are also present. Based on facility records Building #53 (New Truck Scale) also remains near the eastern security building (Building #99).

East of the Spray Pond, two Inverse Ponds remain along with a Remediation Equipment Shed.

## **2.3 Site Operations**

Currently Flow Serve occupies and operates Building #2A (Pattern Storage), Building #7 (Office), Building #8 (Pump Manufacturing), Building #17B (Test and Storage), and Building #24 (Test Building). In 2003, Building 16 was leased to a structural steel fabrication company (Blue Ridge Steel) and Building #37 was leased to Village Bus Company, a school bus company.

Historic operations are best described by operating units. As such, the following subsections describe general operation activities in the five major “Divisions” historically operating at the Ingersoll Rand Company facility.



### **2.3.1 Foundry Division**

The Foundry Division's primary purpose was to cast metal products used in the manufacture and assembly of drills, pumps, compressors, and other products constructed by Ingersoll Rand. Based on EPA's Sector Notebook for the Metal Casting Industry (USEPA, 1998), the processes conducted in the preparation of metal casting include the following.

- Pattern making;
- Mold and core preparation and pouring;
- Furnace charge preparation and metal melting;
- Shakeout, cooling and sand handling; and
- Quenching, finishing, cleaning, and coating.

IR's pattern making operations were centered in Building #1, where wooden patterns were hand-made for much of the foundry's operational history. Patterns were constructed of wood, ceramics, or plastics employing similar production methods throughout operations. Patterns were stored in one of the many storage buildings on site and were likely transported to one of the operating foundry locations (Building #3, Building #4, and Building #33), where mold and core preparation would be conducted.

IR employed a Green Sand Casting process in which sand is shaped around the pattern in a metal box after which the pattern is removed. Cores are used to form any necessary internal cavities associated with the mold/pattern and were also likely molded from sand. Sand was usually bound using an oil-bake method in which oil (natural, synthetic, or resin-based) was mixed with sand prior to molding, and the mold is baked to harden it. It is not known what types of oil were used in initial casting operations. Linocure, oil sand, and isocure processes were used during later operations (Capsule, 1981).

Upon completion of the mold, molten metal could be poured into the completed mold to create a finished cast. IR generally used cupola furnaces throughout early foundry operations and switched to electric arc furnaces in later years. Cupolas were fueled with coke (coal) over which layers of metal, alloys, and flux (a material used to bind to impurities to create slag) was placed. Burning coke would melt the metals and add carbon content to the molten metal. Molten metal was drained from the bottom of the cupola. Slag was drained from a hole higher on the cupola. Electric arc furnaces were powered by electricity in which current is passed through electrodes near or in a hearth containing metal and alloy to be combined. Slag is skimmed off the surface and molten metal is drained by tipping the furnace toward a spout. Molten metal generated from these furnaces could then be ladled or poured into the mold. Based on facility records, iron, steel, brass, and aluminum were the primary components of the castings created for Ingersoll Rand's product line. Several Metallurgy Labs were historically located in various Site Buildings to support foundry operations.

Hot casts were air cooled in or near the foundry location or were cooled in a quenching process practiced in several locations at the site including Buildings #3, #13, #14, #15, #23, and #33.

Quenching involved the rapid cooling of casts in a water or oil bath to achieve certain metallurgical properties.

After air cooling, the sand mold was removed from around the casting. Sand can be reused several times before it is spent and requires disposal. Spent sand was often used around the site to fill areas for impending construction projects. When sand was not required for site building projects, it was disposed at the southern end of the facility property in a landfill (Filling operations are discussed separately in Appendix L).

Once cool the metal cast begins a finishing process in which metal not associated with the final product is removed via hammers, grinders, band saws, abrasive cutting wheels, acetylene torches, etc. Residual refractory material is removed by sand blasting or shot blasting, which occurred in several locations at the site including Buildings #3, #4, #30, and #105. Prior to receiving any coatings, castings were cleaned (Casting & Cleaning Buildings #3 and #30). According to the EPA Sector Notebook, castings are generally cleaned to remove scale, rust, oxides, oil, grease, and dirt often using organic solvents (typically chlorinated solvents, naphtha, methanol, or toluene), emulsifiers, pressurized water, abrasives, alkaline agents (including caustic soda, soda ash, alkaline silicates, and phosphates), or by acid pickling (a Pickling Shed #61 was located west of Building #17 from 1903 – 1950s; pickling operations were also conducted in Building #3). After the casts were cleaned, they may be coated to inhibit oxidation, resist deterioration, or improve appearance by such methods as painting, plating, enameling, resin coating, etc. Facility records indicate that plating was conducted in several locations including Buildings #14, #15, #20, #23, and #251 which were not directly operated by the Foundry Division.

During facility operations, the Foundry Division conducted activities at many facility buildings including the following. A detailed description of buildings and operations at each is included in Appendix H.

- Building #1 (Pattern Shop),
- Building #2 (Pattern Storage and Core Making),
- Building #3 (Casting and Cleaning, Pickling, Sand Blasting, Babbitting, Aluminum and Brass Foundry),
- Building #4 (Iron Foundry, Brass Foundry),
- Building #5 (Carpentry Shop),
- Building #13 (Forge Shop, Blacksmith Shop),
- Building #30 (Casting and Cleaning, Sand Blasting),
- Building #33 (Aluminum and Brass Foundry),
- Building #47 (Propane Facility),
- Building #50 (Acetylene Generator Building),
- Building #57 (Acetylene Generator Building),
- Building #58 (Tar Paper Storage),
- Building #58/N (Pattern Storage),

- Building #60 (Radiograph),
- Building #73/F (Lumber Storage),
- Building #74/G (Flask and Obsolete Pattern Storage),
- Building #75/H (Pattern Storage),
- Building #76/I (Flask and Obsolete Pattern Storage),
- Building #77 (Concrete Storage Bins),
- Building #84 (Lumber Shed),
- Building #85/K (Obsolete Pattern Storage),
- Building #87/L (Lumber Shed),
- Building #89/J (Obsolete Pattern Storage),
- Building #101 (Foundry Office),
- Building #106 (Pattern Storage),
- Building #107 (Pattern Storage),
- Building #A (Reel House),
- Building #E (Flask Storage), and
- Building #U (Forge Shop).

### **2.3.2     *Drill Division***

The Drill Division was responsible for the manufacture and assembly of Ingersoll Rand's Drill products. During early facility operations, Ingersoll-Sergeant's main products were steam and air-powered mechanical rock drills in various sizes. Upon merging with Rand Drill Company in 1905, forming the Ingersoll-Rand Company, air-powered rotary boring tools were added to IR's product line. Later technological developments saw the rise of jackhammer drills and wagon drills. Later, IR introduced a rotary core drill, or Calyx along with air-rotary impact tools, and a motorized "crawler" version of the wagon drill.

In the 1940s a tungsten-carbide rock drill bit was introduced as well as the "Quarrymaster", a self-propelled pneumatic rock drill and precursor to today's drill rigs. In the 1950s, a modification of the jackhammer was introduced as the Jackdrill and several smaller versions of the Quarrymaster were introduced. Through the 1960s and 1970s, drill technologies advanced and IR introduced more modern drilling equipment such as rotary drills, hydraulically actuated rock drills, mine rescue drills, and larger and faster down-hole drills. Virtually every year, the company introduced a new drill product or a substantially improved model (Rodengen, 1995). Compaction products, a satellite of the Drill Division, operated at the Site until 1974 when it was moved from the Phillipsburg facility.

Due to company diversification, the Drill Division at the Phillipsburg facility was moved to Roanoke, VA in the late 1980s and many of the Drill Division structures were abandoned, demolished, or re-tasked for other operations. Currently the facility does not manufacture or assemble any Drill Division products.

During Drill Division operations, the primary industrial processes used included cutting and grinding of metal; metal forging, die casting, heat treating; hardening; tempering and parkerizing; painting; degreasing; and electroplating (Capsule Laboratories, 1981). Additional activities likely included welding, assembly, and testing of newly manufactured equipment.

During facility operation, the Drill Division conducted activities at many facility buildings including the following. A detailed description of buildings and operations at each is included in Appendix H.

- Building #7 (Shipping and Painting),
- Building #13 (Forge Shop, Smith Shop, Heat Treating),
- Building #14 (Heat Treating, Chrome Plating, Degreasing, and Parkerizing),
- Building #15 (Drill Testing, Drill Finishing, Cleaning, Assembly, Welding, Plating, Heat Treating, Degreasing, Parkerizing, and Shot Peening),
- Building #17 (Drill Manufacturing, Welding, Casting, Shot Blasting, and Sand Blasting),
- Building #20 (Hammer Drill Manufacturing, Assembly, Painting, and Metallurgy), and
- Building #23 (Annealing Department, Sand Blasting, Oil Treating, Welding, Storage, Lead Plating).

### **2.3.3 Turbo Division (Compressor)**

Ingersoll Rand began manufacturing compressors in order to supply power to their line of rock drills. During early operations, compressors were driven by steam engines, electric motors, and later, diesel and gasoline engines. Compressor sizes ranged from “portable” mounted compressors to large industrial compressors. Through its expertise in compressor manufacturing, IR began producing compressors for other applications including naval, military, and industrial. More recently, the Turbo/Compressor division manufactured centrifuge compressors, reciprocating compressors, and rotary compressors. In 1987, IR and Dresser Industries formed a joint venture called Dresser-Rand, which prompted the move of Turbo/Compressor operations to a facility in Olean, NY.

Like the Drill Division, the Compressor/Turbo Division conducted metal finishing of iron and steel parts provided by the Foundry Division and assembled the various compressors in the IR product catalog. Primary processes included cutting and grinding, pickling, degreasing, and sandblasting (Capsule Laboratories. 1981).

During facility operation, the Turbo/Compressor Division conducted activities at many facility buildings including the following. A detailed description of buildings and operations at each is included in Appendix H.

- Building #7 (Shipping, Painting, Storage, Office, Testing),
- Building #8 (Compressor Erecting Shop, Testing, Forge),
- Building #9 (Compressor Manufacturing, Babbitting),

- Building #10 (Compressor Manufacturing),
- Building #11 (Compressor Shop, Assembly and Testing, Painting),
- Building #19 (Shear Shop and Forge Office),
- Building #24 (Turbo Test Facility),
- Building #25 (Blower Test and Assembly),
- Building #34 (Compressor Manufacturing and Tool Room),
- Building #36 (Sandblast Facility),
- Building #55 (Air Facilities Test Building, Cut-Off),
- Building #56 (Air Facilities Testing),
- Building #65 (Air Facilities),
- Building #66 (Gas Power Development - Storage)
- Building #91 (Babbitt Building), and
- Building #105 (Shot Blast and Sand Blast Cleaning Shed).

#### **2.3.4      *Cameron Division***

Ingersoll Rand acquired A.S. Cameron Steam Pump Works in 1909 and began Cameron Pump Division operations at the Phillipsburg site by 1913. Cameron made a variety of pumps, particularly those that circulated condenser and brine water for high-pressure compressors. Early pumps included large steam driven vacuum pumps used for various industrial applications. Pump manufacturing operations remained largely the same throughout the years. The pump product line has included steam pumps, reciprocating pumps, submersible pumps, diaphragm pumps, etc. for industrial, oil and gas, power generation, and naval applications. In 1992, a joint venture with the Dresser Pump Company created the Ingersoll-Dresser Pump Company (IDP) which owned and operated the Phillipsburg site. Due to the loss of the other Divisions by the late-1980s, IDP moved operations into many of the buildings in the main portion of the site and demolished the former Cameron Pump buildings. In 1999, the IDP joint-venture was dissolved and the property was returned to Ingersoll Rand. In 2000, Ingersoll Rand sold the Pump Division to Flow Serve Corporation, who currently leases portions of the site for continued pump manufacturing and testing operations.

Similar to the Drill and Compressor Divisions, the Cameron Pump Division received casts from the Foundry. Casts would require finishing via cutting and grinding operations, sand and shot blasting, heat treating, pickling, welding, coating or painting. Upon completion of pump assembly, large concrete-lined pits located in several buildings were used to test the completed pumps. Since the closure of the Foundry, pump manufacturing operations have been reduced to assembly and testing.

During facility operation, the Cameron Pump Division conducted activities at many facility buildings including the following. A detailed description of buildings and operations at each is included in Appendix H.

- Building #251A/B (Power House – Engine Room and Boiler House, Maintenance Shop, Repair/DC Rectifier),
- Building #252 (Main Building – Storage, metal working, assembly, testing, shipping),
- Building #253 (Garage and Small Pump Manufacturing),
- Building #254 (Pickling Shed and Storage),
- Building #255 (Bar Storage),
- Building #256 (Brass Casting Shed and Cut-Off and Storage),
- Building #257 (Erecting Shop and Shipping),
- Building #258 (Pump Testing Pit),
- Building #259 (Office Building),
- Building #260 (Garage),
- Building #261 (Storage, Heat Treating, Casting & Cleaning),
- Building #262 (Storage Building),
- Building #263 (Gas Test House),
- Building #264 (Paint/Oil Storage), and
- Building #22 (Pump Test Facility).

### **2.3.5      *General Division***

As previously indicated, the General Division was responsible for the all activities not directly related to manufacturing. These activities included the day-to-day facility operations and site management, waste management, advertising, sales, purchasing, accounting, engineering, etc. During early site operations the General Division's operations were centered in Building #6 (Main Office), Building #7 (Shipping), and Buildings #11 and #12 (Power House).

Throughout operational history, several other buildings were partially or exclusively used by General Division and include:

- Building #5 (Cafeteria),
- Building #6 (Office, Telephone Room)
- Building #12 (Power House),
- Building #18 (Fuel Oil Pump House, Foam House),
- Building #20 (Bentley Administration Building),
- Building #26 (School, Office, and Training Building),
- Building #27 (Hospital and Dispensary),
- Building #28 (Pump House),
- Building #29 (Locomotive House),
- Building #35 (Chlorinator Shed),
- Building #38 (Garage),
- Building #40 (Store),

- Building #42 (Bunk),
- Building #78 (Reservoir, Spray Pond),
- Building #89 (Truck Garage),
- Building #110 (Pump House),
- Building #111 (Gas Compressor House), as well as
- Various material storage sheds, pump houses, vehicle storage and maintenance garages, bulk storage tanks, etc.

Other buildings historically used for manufacturing later were employed as General Division structures. This included Building #20, which was initially a manufacturing building and later became office space.

Conversely, several buildings were originally used in General Division operations and became part of one of the manufacturing divisions. Such buildings include Building #7, which was originally shipping, later became part of the Compressor/Turbo manufacturing and assembly area. A detailed review of buildings is provided as Appendix H.

Some of the major operational activities are explained below.

#### **2.3.5.1 Power Generation**

The General Division operated the Powerhouse from 1905 through the early 1990's. It is possible that the powerhouse ceased producing electricity in the 1940's when the main transformer yard was moved from east of the Power House to north of the Spray Pond; however, facility documentation indicates its use into the early 1990's. Initial operations used coal-fired boilers to create steam to heat facility buildings and to drive turbines to generate electricity for lighting. As operations grew, and various pieces of electrical equipment became standard for industrial operations, the power house was modified several times and included replacement boilers and generators. At some time in the 1910's or 1920's, the boiler was fed both coal and fuel oil. By the 1970's, it appears that oil became the sole fuel source with natural gas backup. Facility records indicate that some waste oil and waste solvents were entered into the fuel stream for disposal. It is unclear how long this practice may have occurred.

#### **2.3.5.2 Electrical**

ENSR performed a review to locate and identify electrical units that may have contained PCBs, such as oil switches and transformers, using map records from the 1940s -1980s. A recent inventory of oil containing electrical equipment is included as Table 4 and a map of current and historic transformer locations is provided in Appendix M (Figure M-4). During early site operations electricity was generated by the Powerhouse for supply to the facility buildings. It is presumed that the facility was connected to the local electrical grid in the 1940's when the transformer yard north of the Spray Pond was installed. It is unclear when the Powerhouse ceased producing electricity.

### **2.3.5.3 Facility Maintenance**

Facility maintenance includes waste disposal, grounds keeping, construction and demolition activities, water supply maintenance and treatment, utility maintenance, and other miscellaneous activities.

#### Waste Disposal

Waste disposal activities included the removal of facility garbage as well as industrial waste – both hazardous and non-hazardous. Appendix I summarizes historic facility disposal practices. Generally, facility trash and waste materials were placed in the landfill (AOC-29) located south of the facility. Some of this waste was burned in one of several small incinerator locations (AOCs 23, 33, and 34) located across the site to reduce volume prior to placement in the landfill. During later operation, limited waste products would be placed in the landfill with waste oils and other hazardous materials disposed of at offsite locations. By the late 1970s all facility wastes were being transported off-site until the new Class II-A landfill was permitted to the west of the Old Landfill. This landfill was permitted to accept only foundry sand and demolition debris. At the time of this writing, the Class II Landfill remains in operation, although no waste has been disposed there since the mid 1990s. Solid waste is currently removed for off-site disposal.

#### Grounds Keeping

Grounds keeping include general landscaping and care of facility grounds. During early operations grounds keeping may have included lawn mowing and weed suppression. Previous employee interviews indicated that weed suppression may have been conducted by spreading oil or solvents along fence-lines, railroads, or other areas to prevent plant growth. Other activities would include snow removal and road maintenance. Currently, IR subcontracts all grounds keeping activities to a commercial landscaping company.

#### Water Supply

Facility operations required significant quantities of water to support the various production lines and provide testing, fire suppression, and potable water to the facility. To maintain water supply, IR installed three potable wells on the site throughout operational history; owned and operated the Lopatcong Water Company, which provided a connection to a reservoir located approximately 5-miles from the site, and connected to the Phillipsburg water supply. Additionally, an on-site reservoir was constructed (i.e., the Spray Pond) to provide a recirculating supply of non-contact cooling water. The following subsections summarize each of these components.



### 1903 Potable Well

The facility's first well, located between Buildings #8 and #12, was drilled in April 1903 by Rust Well Machinery Company as the plant's main water supply. According to a cross section of the well dated September 26, 1905 the well is 806 feet deep and was constructed using 90 feet of 10-inch diameter casing and 470 feet of 6-inch casing. Water was extracted from the well from a 775-foot long 4-inch diameter pipe using an air lift technology. Initial pump tests indicated the well was capable of 225 gallons per minute.

The well was retrofitted in 1915 by the William Stothoff Drilling Company of Flemington, NJ to enlarge the open borehole and replace the water extraction pipe. The new arrangement consisted of 760 feet of 4-inch diameter piping, a 4-foot 5-inch packer at approximately 760 feet below grade, and an additional 42 feet of 4-inch pipe with holes drilled into it. It reportedly yielded approximately 115 gallons per minute (Untitled Map, 1915).

Water removed from the 1903 production well was stored locally in a water tower (Building #86) of unknown volume estimated to be approximately 70 feet tall. This water tower was removed from the facility at some point after 1960 when water storage was moved to AST #86. No documentation exists to verify formal abandonment of the well.

### 1934 Potable Well

The facility's current production well (known as WW-1) was drilled at the northwest corner of the spray pond in May through July 1934. The original driller is unknown. This well was constructed using 220 feet of 8-inch diameter casing, with open borehole construction from 220 feet to its completion depth of 460 feet below grade (Map #MD 875, 1938). Water was extracted from the well from a 218-foot long, 2-inch diameter pipe using air lift technology (Map #MD 781, 1936).

In 1979 this well was also retrofitted with a 6-inch diameter casing from 193 feet below grade to 358.5 feet below grade. The 8-inch original casing was packered off from the six-inch diameter casing at approximately 195 feet below grade. The well received 100 feet of 6-inch diameter well screen, extending from 358.5 feet to 458.5 feet below grade. The final 1.5 feet of borehole was sealed off using cement and a trap door bucket (Map #MD 2909, revised 1979). According to facility records, this well is still in use and is currently the sole supply of water for the site.

Upon removal of the water tank at the original 1905 well, Tank #79 located at the eastern facility boundary, was either demolished and replaced with Tank #86 or was reconditioned and renamed to serve as the facility water tank. At this writing, the tank remains in service.

### 1974 Potable Well

This facility well was drilled east of Building #110 in 1974 by Layne New York Company (Linden, NJ), and was constructed utilizing 10-inch casing set at a depth of 223 feet below grade and 8-inch open borehole construction below 223 feet below grade. Completion depth of the well is 503 feet below grade (Map #MD 2941, 1974).

Initial pumping tests of the well indicate that the well yielded 785 gallons per minute; however, the pumping of the well appeared to cause the development of sink holes in the eastern portion of the site. Oil was discovered on the groundwater at this location. As such, the well was never put into full scale use. The well remains onsite, and is used for monitoring purposes.

### Lopatcong Water Company

The Lopatcong Water Company was a wholly-owned subsidiary of IR from the early 1900s into the 1970s when it was sold to the Garden State Water Company. Documents indicate that the Lopatcong Water Company operated a reservoir located on Scott's Mountain, approximately 5-miles northeast of the site, and constructed a water main connection to the site. During later years, it appears that the Lopatcong Water Company began serving local residences and business. In 1974 the Lopatcong Water Company was transferred to Garden State Water Company.

The water main pipe enters the site at the northeast corner traversing the site from east to west ending at Building #44, the meter house, where a physical connection to the now independent water company is located. Currently, the connection is closed and all site water is supplied by WW-1, installed in 1934.

### Spray Pond

The Spray Pond was constructed in 1905 as a condenser and cooling pond for non-contact cooling water to the Boiler House as well as supply water for pump testing. It is unclear when the eastern stormwater collection and drainage system was connected to the Spray Pond. It is likely that stormwater drained to the pond by conduit or by overland flow since its installation. Additional information regarding stormwater discharges at the facility is included in Appendix J.

### Drinking Water

As stated, water removed from the onsite potable wells has been used for potable and industrial purposes. Due to the identification of chlorinated organic compounds in water pumped from WW-2, an Air Stripper was added to the system at Building #111. To maintain compliance with drinking water standards the facility has operated treatment facilities to treat potable water. Historical records indicate that chlorine gas was used (Buildings #28 and #110) to chlorinate water. In the 1990s, in response

regulation requiring sampling for lead and copper, which may leach from pipes and pipe solder, IR began a monitoring program with treatment of potable water with a corrosion inhibitor.

### **2.3.6 Other Site Operations**

#### **2.3.6.1 Oil-Electric Locomotive Engine Production**

Historical documents indicate that IR manufactured and assembled diesel-electric engines in a partnership between IR, General Electric, and American Locomotive Company. Due to the success of IR's internal combustion engine for use in its compressors, IR was able to make the first commercially successful diesel locomotive engines. Based on limited documentation, it appears that American Locomotive supplied the frame; GE provided the controls, gear, and assembly; and IR provided the diesel engine. It is unclear how much of this activity was conducted at the Phillipsburg facility but it is clear that internal-combustion related operations were conducted in Buildings #8 and #25 and possibly the Locomotive House – Building #29. These operations appear to have been conducted from the 1920s to the late 1930s.

#### **2.3.6.2 Ingersoll Rand Trucking Operations (IRTO)**

Upon the construction of Building #37 in 1978 at the northeast corner of the facility property, Ingersoll Rand operated a distribution facility for products produced at the Phillipsburg plant. Trucking operations would likely have included storage and maintenance of trucks as well as logistics. During the restructuring of facility divisions and their removal from the site in the late 1980s, it appears that IRTO's operations also ceased. Since 2002, Village Bus Company has conducted School Bus operations from this location under a lease agreement.

#### **2.3.6.3 Mining Operations**

##### Experimental Mine

Based on the appearance of mine-associated buildings on the facility's 1913 FIA map, mining activity likely began onsite between facility construction in 1903 and 1913. It is believed that the mine was constructed as a place to test Drill Division equipment, but it is unclear if the Drill Division was responsible for its actual operation. IR did not conduct any mining for raw material – coal or ore – for their operations on or off site. As such, operations are believed to consist solely of the breaking of rock via IR's rock drill products and blasting. Rock removed from the formation would have been brought to the surface and likely placed in the landfill.

Earliest mapping of the site's subsurface mining tunnels (Map #MD 314, 1925) shows that the mine's first tunnel ("Old Tunnel") extends from the mine's shaft approximately 45 feet to the south-southwest. Later documentation (Map #MD 460, 1928) indicates the "Old Tunnel" is found approximately 40 feet

below ground surface (bgs). By 1925, a deeper network of tunnels was present onsite at 80 to 90 feet bgs (depending on ground surface topography). The 1925 deeper tunnel network extends from the shaft to the north-northeast, forming a horizontal loop around a central pillar below the ground surface. The tunnels range in width from ten to fourteen and a half feet, and the total length of mined tunnel in 1925 is approximately 285 feet.

Cross sections of the mine works (Map #MD 460, 1928) indicate that the "Old Tunnel" was no longer actively mined, but was being used at that time for powder storage. No further information is available describing what was being stored in the 40-foot-deep tunnel at that time. The cross section also indicates that the mine shaft terminated in a sump which is estimated to extend below the depth of the deepest tunnel by seven feet.

By 1936 the total length of tunnels mined below ground surface at the experimental mine was approximately 525 feet. Additional mined tunnels radiate off of the central loop as shown on 1925 documentation to the north, east, and west. 1936 documentation indicates that the mine shaft was approximately five feet wide. A mine survey from around this time (Map #MD 855, 1938) also indicates that tunnel heights range from five to fourteen feet high, and that tunnel profiles were irregular shapes hewn from the rock.

The last documentation of the mine is a 1953 revision of the 1938 mine survey. This survey shows no additional tunnels mined since the original survey in 1938. The survey does identify some retaining walls, and notes that one of the tunnels appearing in the 1938 survey (52 feet in length) was not surveyed due to collapse of the tunnel. The "Old Tunnel" is also not mapped on the 1953 revision survey; however, it is not known whether this was due to a collapse condition or simply was omitted from the survey at that time.

No records exist for a formal closing of the experimental mine works, but available aerial photography for the site suggests that the mine was probably formally closed between 1974 and 1981, when the structures associated with the mine were demolished. Currently, no surface expression exists of the former shaft or any ventilation shaft.

### Quarry

Facility maps MD 1775 (Revised 1955) and MD 2217 (June 7, 1957) show an area southeast of the iron foundry (Building #4) identified as a quarry. This area is also identified on the 1933 FIA map, and an area of disturbed ground appears on the 1939 aerial photograph of the facility. The quarry has dimensions of approximately 65 feet (north-south) by 70 feet. No measurements of depth are available; however, the 1939 aerial photo suggests it is very shallow. In the facility's 1951 aerial photo the area appears, but appears to be either filled in or overgrown with vegetation.

The use of this area as a quarry cannot be confirmed based on currently available information; however it may have been used as a testing area for Ingersoll-Rand's Quarrymaster drilling machine, which was produced onsite.

#### **2.3.6.4 Fuel Storage**

##### Coal Trestle and Other Coal Storage Areas

The facility's coal trestle was constructed in 1917 on the eastern side of the facility south of the current bulk AST farm. It rose from the surrounding ground up to approximately thirty feet. This served as the facility's primary coal storage area. Aerial photography shows that piles of coal were stored on both sides of the trestle through the 1930's and 1940's, with facility coal use diminishing after this time (1939, 1951, 1957, 1959, 1962, 1966, and 1974 aerial photographs). Based on a review of historic aerial photographs and site reconnaissance, the coal trestle appears to have been removed between 1974 and 1981, with the concrete foundation left in place and buried beneath several feet of fill.

Other coal storage areas (detailed in Appendix M) include an area north of Building #13, an area near the coal elevator at the east end of the facility powerhouse (Building #12), an area at the southeast corner of the iron foundry (Building #4), and at points of use (Buildings #4 and #14, for example [FIA #698, 1933]). Additionally, residual coal fragments appear at several locations where railroad track formerly existed.

##### Oil Storage

Oil storage has taken place in above-ground and underground storage tanks located throughout the site. It appears that the main oil storage was conducted in the ASTs located at the eastern facility boundary. Oil from this location was pumped to three 10,000-gallon day tanks (Building #104) for use in daily power house operation. Fuel oil lines also linked other tanks around the site to the ASTs or the day tanks. Specialty oils, such as quench oil was stored in ASTs and USTs near the location of use (heat treating areas). Appendix M summarizes the storage tank identified through our review of historical documents.

#### **2.3.6.5 Filling Operations**

Filling operations have been conducted at the site since facility development in the early 1900s. Filling was conducted in the Foundry area as well as towards the south of the main facility buildings to raise topographic grade for construction projects. Fill was generally composed of spent foundry sand, which was generated by foundry operations. Additionally, facility wastes were placed along with foundry sand at the southern portion of the facility area. Waste material disposed of include construction debris, spent coolant and waste oils, cafeteria garbage, and ash from site incinerators and various fuel combustion sites including the powerhouse boilers and various ovens and furnaces. Filling operations

are detailed in Appendix L and Figure 3 presents a map of areas that are known to have been filled. All filling activities were ceased in 1981 and the Old Landfill was closed

A permitted Class-IIA landfill was constructed at the southern side of the facility property east of the Cameron area in the late 1980s and was opened in 1990. The "New Landfill" was permitted for the acceptance of construction debris and foundry sand. To date, the landfill has received approximately 31,228 cubic yards of material, 47% of its permitted capacity.

### **2.3.7 Subsurface Utilities**

Subsurface utilities present at the site include drinking water pipes, stormwater and sanitary sewerage, electrical lines, natural gas lines, and various process piping including steam and hot water piping, non-contact cooling water, fuel oil and gasoline piping, quench oil, paraffin and kerosene, oxygen and acetylene piping, and compressed air lines.

Drinking water pipes apparently service all the facility structures and are present throughout the facility property. Stormwater and sanitary sewerage has undergone a variety of modifications throughout facility history. A map of current and historically identified stormwater and sanitary sewerage is presented in Appendix M (Figure M-8). Natural gas pipes enter the site on the eastern side and traverse the eastern facility border until the central portion of the site, where it turns toward the powerhouse. Figure M-8 identifies the approximate location of this utility. Locations of subsurface electrical lines are not well documented in site history.

Process piping, as indicated above, included a variety of process water piping which would have included steam, hot water, and non-contact cooling water. These pipes served much of the facility structures providing steam and hot water for heating. Non-contact cooling water was recirculated from the Spray Pond to the Powerhouse.

Oxygen and Acetylene lines were identified in the foundry area and may have existed in the main facility area where welding was conducted. Since foundry operations and acetylene generation has ceased, these lines have been abandoned.

Fuel oil, gasoline, quench oil, and paraffin were generally piped from UST locations to their point of use which was not often far from the storage tank. Fuel oil lines from the bulk storage tanks, formerly were present between the tank farm and the Powerhouse (AOC-38), but have been abandoned or removed. Underground fuel oil pipes were replaced with aboveground piping in the 1980's when Building #104 was constructed to house the three 10,000-gallon fuel oil storage tanks. Figure M-8 presents the historic locations of these pipes when documentation was available to discern their locations.

### **2.3.8 Wastewater Discharges**

Wastewaters generated at the facility have often been discharged into the sanitary sewer. Currently the facility has a SIU permit for these discharges. Several septic systems, cess pools, and leach pits were identified during this historical review. All of these structures are presumed to have been abandoned. Previous environmental investigations have located several of these structures and, as detailed in Appendix E, removed them. Locations of septic structures identified during this review are detailed in Appendix M as they are potential areas of concern.

The Spray Pond has historically accepted non-contact cooling water from the Powerhouse and other facility operations, provided test water for pump testing, receives water discharged from the onsite groundwater remediation system, and receives stormwater from the eastern portion of the facility. As previously indicated, water discharged from the Spray Pond ultimately enters Lopatcong Creek. These discharges are all currently monitored under a NJPDES permit.

Since the installation of the permitted "New Landfill" in the early 1990's, the stormwater detention basin in the northwest corner of the site has accepted leachate and runoff from the New Landfill. This discharge is currently monitored under a NJPDES permit.

### **2.3.9 Surface Water**

#### **2.3.9.1 Spray Pond**

The spray pond is a 2.5-million gallon concrete-lined reservoir used for non-contact cooling water, pump test water, and stormwater retention. This reservoir was apparently built at the time of the facility's original construction. Plans for its construction (undated) indicate that it was excavated into a hillside to the north and west, and contained using levee-styled retention walls on the south and east sides of the structure.

A shallow addition to the pond was added in 1910 at the entrance of the recirculated cooling water to the pond, presumably to aid in its cooling. In 1918 a pump house (Building #28) and piping were added to allow the pond water to be sprayed over the reservoir surface to increase cooling.

This pumping and spraying equipment was upgraded between 1974 and 1981, based on aerial photography, to reflect the current pond equipment and appearance.

Currently, water from the Spray Pond discharges by way of an overflow pipe to a subgrade oil water separator to the east and then to the northern Inverse Pond. Historically, water may have been discharge directly to the ground surface east of the Spray Pond or piped directly to the Lopatcong Creek. Evidence for each of these discharge methods has been identified; however, the dynamics of historic discharge from the pond remains unclear. Historic aerial photographs appear to show surface

evidence of drainage from the eastern side of the Spray Pond with the appearance of sinkholes which filled with water. These sinkholes were later filled and a second Inverse Pond was installed. Historic site plans also evidence the presence of a subgrade discharge pipe that began near the Spray Pond Discharge and diverted water parallel to the ephemeral stream ditch and into a concrete lined culvert which discharged to the Lopatcong Creek at the southern site boundary. The concrete culvert is visible on historic aerial photos and was observed during recent site reconnaissance.

Oil skimming and collection equipment were added immediately upstream of the entrance point of the recirculated non-contact cooling water prior to 1937. These consist of a Brill skimmer (AOC-22) and a weir-based oil-water separation area. Another weir-based oil-water separator was added downstream of the spray pond around 1949 (untitled drawing, 1948).

Sediment at bottom of the spray pond is known to contain concentrations of total petroleum hydrocarbons (TPHC), polychlorinated biphenyls (PCBs), metals, and polycyclic aromatic compounds (PAHs) in excess of applicable soil cleanup criteria (IDP, 1996), and has been designated AOC-30 (1994 ACO Remedial Action Workplan).

#### **2.3.9.2 Inverse Ponds**

The facility's two inverse ponds appear to have been installed to serve as oil containment structures, in the event of a catastrophic oil release from the bulk AST farm. The ponds are located southeast of the Spray Pond and act as secondary settling basins. They feature inverted discharges, where effluent water exiting the ponds must rise through a section of vertical pipe from the bottom of the ponds by displacement, thus creating a water body capable of retaining oil on its surface by displacing the denser water.

The northern inverse pond appears in the 1939 aerial photo, revealing that it was constructed prior to that time (although no construction documentation is known to exist). At this time a small pond or depression is visible immediately to the northern pond's eastern side. The depression is likely a sinkhole as described in other facility records.

The southern inverse pond first appears in the 1951 aerial photograph of the facility. In this photo the small pond or depression adjacent to the northern pond is also absent.

The two inverse ponds were modified with a gunnite liner in the 1980s. Facility records (Map #MD 3141, undated) notes that proposed renovations to the northern inverse pond are to include excavation of the pond's banks to remove oil, which may have entered the pond during the pumping and discharge to ground surface of the oil-impacted potable well that was installed in the 1970s.



Sediment at the bottom of the inverse ponds and soils below the inverse ponds are known to contain TPHC, PAH, PCBs, and/or metals in excess of applicable soil cleanup criteria; Further, the gunnite linings of one or both ponds is known to leak (Tellus, 1994 and ENSR, 2001).

The inverse ponds remain onsite, serving as part of the facilities stormwater conveyance to the local surface water. Since bulk storage of oil in the AST-farm has ceased, the ponds are no longer needed as a retention structure for spill prevention and control purposes. They were designated as AOC-31 in the 1994 Draft RIWP and plans are currently being formulated for their final closure.

#### **2.3.9.3 Four Former Ponds, Western Side of Facility**

Four ponds appear in the 1951 aerial photograph on the western side of the facility. Through the aerial photographic record, the two more southerly ponds appear to slowly fill in over the years. The other two (AOC- 32) were excavated in the late 1980's as part of the development of this land into a larger stormwater retention pond. The 1976 Spill Prevention, Control, and Countermeasure (SPCC) plan for the facility reports all four ponds featured inverted discharges for the potential retention of floating oils, and that they discharged to the municipal sanitary sewer system. None of these ponds currently exist onsite.

## 3.0 ENVIRONMENTAL REVIEW

### 3.1 General Physical Characteristics

#### 3.1.1 Location and Surroundings

The former Ingersoll-Rand site is located at 942 Memorial Parkway in Phillipsburg, New Jersey and occupies approximately 383 acres within the Town of Phillipsburg and Lopatcong Township. The facility consists of multiple buildings, foundations of former buildings, roads and parking areas, two landfills, several ponds, landscaped areas, and agricultural fields. Historical facility maps were submitted in the 1994 RIWP and are not repeated here. A current site map is included as Figure 2.

As shown on the USGS 7.5-minute Quadrangle Map for Easton PA-NJ (Figure 1), the site is situated at the top of a ridge at approximately 360 feet above mean sea level (AMSL). Topographic elevation decreases in all directions but is most evident toward the southeast. The area surrounding the site is of mixed commercial, residential, and agricultural use. Eastward, the site is bounded by Route 22. Some commercial development is evident along Route 22, but beyond those businesses, agricultural activities persist. The southern portion of the site is largely bounded by Lock Street and some residential development. Land use beyond Lock Street appears as mixed agricultural and wooded. The northern portion of the site is bounded by a railroad right of way and Route 22. In this area, Route 22 is heavily developed with commercial and residential structures. The western boundary of the site at Roseberry, Center, and Green Streets is largely residential with some commercial development. No sensitive receptors were identified in the surrounding community with potential migration pathways connecting them to the site. A detailed receptor evaluation was completed in the 1994 RIWP and a Baseline Ecological Investigation for the southern portions of the site was submitted in July 2002. An updated Baseline Ecological Evaluation for the entire Site is in progress with final report submission expected later in 2004.

#### 3.1.2 Block and Lot Description

As reported in the General Information Notice (GIN) submitted to NJDEP on June 30, 2004, the IR property occupies the following Lots and Blocks. Note that only Block 3201, Lot 7 comprises the facility area which is the subject of this report; those Block and Lots shaded in gray exist outside of the facility area and are not addressed in this report.

Lot and Block Summary		Block Lot Size (Tax Maps)
<b>Town of Phillipsburg</b>		
Block 3201 Lot 7		206 Acres
Block 3301 Lot 1		29 Acres
Block 3301 Lot 2		29 Acres
Block 3301 Lot 4		16 Acres

Lot and Block Summary		Block Lot Size (Tax Maps)
<b>Lopatcong Township</b>		
Block 101 Lot 1		101 Acres
Block 101 Lot 1.01		2 Acres
		<b>TOTAL 383 Acres</b>

### 3.1.3 Topography and Drainage

General topography at the site ranges from gently to steeply sloping as the property is situated on the top of a ridge extending from the north-northwest. At the site, topography begins to slope steeply to the west, south, and southeast; and moderately to the east.

The facility buildings are present at an approximately elevation of 360 ft above mean sea level (AMSL) with the lowest elevations at the site nearing 225 ft AMSL. The facility area is generally level and slopes off steeply towards Roseberry Street on the west side and towards the eastern farm fields – east of the main plant area. Historically, topography sloped more gently to the south. However, filling activities associated with the current and former landfills have changed topography in this area to a much steeper slope at the southern edges of the landfills. Beyond the landfills, the site slopes gently to moderately to the Lopatcong Creek, which is present at an elevation of approximately 230 ft AMSL.

Surface runoff in the plant area, on paved (impervious) surfaces, is generally channeled into a stormwater sewer network, which drains the western portion of the site into the Stormwater Detention Basin and the eastern portion of the site into the Spray Pond and Inverse Ponds. Much of the stormwater that falls on the remaining permeable surfaces (agricultural fields, lawns, etc.) likely infiltrates to the subsurface or is directed via overland flow toward stormwater catch basins.

### 3.1.4 Soils

The naturally occurring soils at the site consist entirely of the Washington Loam (Soil Survey of Warren County, 1977). This brown, yellow-brown, red-brown silty clay glacial deposit overlies most of the bedrock in the area. The deposit is Quaternary in age (approximately 125,000 years old) and is commonly called “older drift” or “Jerseyan Drift”, which is older than the more common Wisconsin glacial deposits found elsewhere in New Jersey. This overburden formation is generally homogenous in the Phillipsburg area with trace sand and gravel and in some areas may be a clayey silt rather than a silty clay.

The NJDEP GIS data for soils in Warren County identify the soils at the site as one of four groups: WaB, WaC2, WnD, and Wp. WaB (Washington Loam, B Horizon) soils comprise most of the site and are defined as Washington Loam, 3–8% slopes. The texture of these soils consists mainly of sandy

clay loam through heavy loam and clay loam to silt loam, with a hue of 7.5-10 YR, value 4 or 5. WaC2 (Washington Loam, C Horizon) soils are identified in the southern farm fields and are defined as Washington Loam, 8-15% slopes, eroded. The texture of these soils consists mainly of sandy clay loam to silt loam and the gravelly analogs, with a hue of 10YR or 7.5YR, value of 5 or 6. WnD soils appear at the southeastern corner of the site near the former farmhouse. These soils are defined as Wassaic Rocky, Gravelly Loam, 15-25% slopes. Finally, along the Lopatcong creek, soil is classified as Wp, the Wayland Silt Loam, 0-3% slopes.

Fill is also present over much of the facility portion of the site and consists of mainly gray to black sand sometimes mixed with other debris. Fill was generated on site as the sand used in the foundry casting process was spent. Spent foundry sand was used onsite to level ground for construction projects or was disposed of (for much of the site's operational history) at the Old Landfill. Thickness of the fill varies across the site and ranges from zero to 40 feet. Fill is expected to be thickest at the former landfill (AOC-29) located toward the southern end of the facility. Fill material was also imported from local areas and appears similar to the native site soils.

Soil boring logs prepared confirm the fill is present in many areas of the site and overlies native soil, which is often characterized as an orange-brown silty clay. Bedrock was encountered at several soil boring locations ranging in depth from 2 to greater than 30 feet.

### **3.1.5     *Geology***

Bedrock underlying the site consists of three major geologic units (as mapped by Drake (1967)) ranging in age from the late Cambrian through the early Ordovician periods. The first, the Allentown Formation, which is present throughout the western portion of the site, consists of a very fine to medium grained, gray to dark gray dolomite. Boring logs from monitor wells, recovery wells, and test holes in this area of the site indicate that bedrock surface elevation increases from west to east until its apparent contact with the Rickenbach Formation, creating a ridge in the bedrock topography which traverses the site from north to south.

The Rickenbach Formation, a part of the Beekman Group of Lower Ordovician age (approximately 415 million years old) is a fine to coarse grained, light to dark gray dolomite with some breccia and chert beds. This formation is present throughout much of the eastern portion of the site.

The Epler Formation, which contacts the Rickenbach Formation at the southeastern portion of the site, consists of interbedded, very fine grained, light to medium gray limestone and fine to medium grained, light to dark gray dolomite.

The two different formations of dolomite in this area (Allentown and Rickenbach) are difficult to distinguish due to their lithologic similarities and general lack of fossils. In the Phillipsburg area, the formations described above are folded in a recumbent fashion. To add complexity, a thrust fault (the

Wipporwhill Thrust Fault) and an antiform (the Lopatcong Antiform) are located within ½-mile of the site.

Based on the lithologic data collected from the soil borings and wells installed at the site, bedrock fractures are present at various depths throughout the site. Additionally, the bedrock displays characteristics of an active karst aquifer, as sink holes periodically appear on the site and wells often collapse and have to be re-drilled or abandoned. Open void spaces have also been encountered during drilling activities at various locations onsite.

In NJDEP's October 28, 2003 Comment letter regarding ENSR's November 2002 Groundwater Remedial Investigation Report, NJDEP requested that alternative interpretations of the local geology be considered. ENSR is in the process of reviewing the literature as well as site specific data in effort to present a new geologic conceptual model to the Department. We expect to submit the geology re-evaluation in the 2004 Groundwater Monitoring Report scheduled for submission in November 2004.

### **3.1.6     *Hydrogeology***

Groundwater at the site is present in the fractures and openings in the bedrock. Recent gauging measurements (February 2004) show that groundwater is present at depths ranging from 3.8 feet below ground surface (bgs) at the southeast corner of the site near Lopatcong Creek to 117.23 feet bgs at the Old Landfill. Groundwater potentiometric surface ranges from 226.94 feet AMSL to 305.72 feet AMSL with an average of 271.34 (n=66). Recent quarterly groundwater measurements also indicate seasonal fluctuations in groundwater elevation with groundwater elevations fluctuating between 0.5 feet to 34.5 feet over the past year (average groundwater elevation fluctuation at each well was approximately 10 feet).

Based on groundwater elevations calculated over the site, it appears that a groundwater divide occurs along the stratigraphic contact of the Allentown and Rickenbach Formations. Groundwater potential generally follows the bedrock topography, flowing westward along the western side of the groundwater divide and southeast at the eastern side of the groundwater divide. However, although a potentiometric gradient exists, this does not necessarily indicate flow. Actual groundwater flow will be controlled by the complex fracture system and solution cavities present in the bedrock aquifer.

As indicated in Section 3.1.5, ENSR is in the process of preparing a geologic review and conceptual model of bedrock, which may provide additional insight into the hydrogeologic regime at the site.

### **3.1.7     *Surface Water and Wetlands***

Man-made impoundments are present in several locations at the site. A large Stormwater Retention Pond is located toward the northwest corner of the site. A Spray Pond, used to recycle non-contact cooling water (as well as a stormwater detention basin), is located centrally in the site just east of the

facility buildings. Two Inverse Ponds are located approximately 300 feet east of the spray pond and receive excess water from the Spray Pond via an underground pipe. The inverse ponds discharge (under NJPDES permit #0004049) into the Ephemeral Stream, which traverses the southern portion of the site approximately 2,200 feet toward the south-southeast where it merges with Lopatcong Creek.

Based on the NJDEP Freshwater Wetlands Maps as presented in the NJDEP GIS Resource Data CD-set (1996), wetlands are present on the Ingersoll-Rand site. Specifically, a strip of deciduous wooded wetlands are identified at the northwest corner of the site. The Stormwater Retention Pond is identified as two types of deciduous wetlands. The areas including and surrounding the Inverse Ponds and Ephemeral Stream are classified as modified (disturbed) wetlands. And the Spray Pond is classified as an artificial lake.

In 2003 ENSR conducted a wetland delineation and a state and federal water body identification. Overall, the field studies did not confirm the presence of wetlands in the locations indicated by National Wetlands Inventory, NJDEP wetland maps, and USDA soils maps. ENSR did identify one emergent wetland in the northwest portion of the site, a location depicted as scrub-shrub wetland in regulatory wetland maps. Eight water bodies were identified within the 400-acre property during the field study. These include two intermittent streams, one perennial stream (Lopatcong Creek), one drainage basin and three detention ponds. Detention ponds are generally used to control the flow of water and to allow for sediments to filter out while drainage basins are used to collect stormwater runoff from adjacent roads and parking lots. An updated presence-absence study and Letter of Interpretation is in progress and will be submitted later in 2004.

### **3.2 Environmental Database Review**

As part of ENSR's investigation of the Ingersoll-Rand facility property, a review of various governmental databases was conducted. EDR of Milford, CT provided a database report based on ASTM-requirements for search radii. To account for the size of the site, all radii were extended by ½-mile. A copy of the EDR database report and executive summary are included in Appendix C along with an ENSR-prepared summary of pertinent findings. As detailed, the IR facility is listed on the CORRACTS, RCRIS-TSD, RCRIS-SQG, SHWS, State Landfill, UST, FINDS, MLTS, FTTS, NJPDES, NJ Spills, and NJ Release databases.

### **3.3 Previous Environmental Investigations**

Environmental investigations at the site were commenced in response to the identification of LNAPL on the groundwater surface beneath the plant area in the 1970s as well as in response to NJDEP inspections which identified issues with an AST and the "Old Landfill". This led to the development of a Landfill Closure Plan in 1981, the installation of additional monitoring wells as required by a discharge to groundwater permit, installation of a groundwater and LNAPL recovery well network with eight dual

pump recovery systems, and the closure of several site above-ground and under-ground storage tanks. Since this time soil and groundwater investigations have progressed and resulted in the discovery of 41 soil AOCs and 4 groundwater AOCs. To date, 25 AOCs have received NJDEP concurrence that No Further Action is required or that no additional investigation will be required but the AOC must be included in a Deed Notice to be implemented upon completion of investigative activities.

Appendix E provides a more detailed review of the environmental activities conducted at the site.

### **3.4 Summary of Environmental Permits**

Currently, the facility operates under several permits including a solid waste facility permit for the operation of the onsite Class II Sanitary Landfill; a discharge to surface water permit for stormwater, non-contact cooling water, and discharge from the groundwater recovery system; a water allocation permit for potable water withdrawal as well as groundwater recovery by the remediation system; a physical connection permit for connection with the public water supply (currently the connection is closed), air permit(s) for operations at the FlowServe facility, and a RCRA permit for FlowServe operations. An EPA-envirofacts query for the facility is presented in Appendix K along with permit details.

Facility documents reviewed include various notices of violations for permits held through the 1970s, 1980s, and early 1990s. A detailed review of violations was not conducted but appeared to consist largely of administrative deficiencies. Specific violations of consequence were described in other sections of this report.

## 4.0 POTENTIAL AREAS OF CONCERN

Based on the documents reviewed as part of this Site History Report several potential Areas of Concern were identified in addition to those identified through previous investigations (Appendix E). These potential areas of concern can be summarized in 15 broad groups of AOCs including the following.

- Former Coal Storage Areas (AOC-46);
- Former Locations of X-Ray Equipment (AOC-47);
- Former Mine (AOC-48);
- Former and Current Transformer Locations (AOC-49);
- Former Septic Systems, Dry Wells, Cesspools, and Leach Fields/Pits (AOC-50);
- Former Onsite Ponds (AOC-51);
- Building Sumps, Pits, and Floor Drains (AOC-52);
- Site Subsurface Utilities (AOC-53);
- Former ASTs and USTs and fuel filling areas not previously identified (AOC-54);
- Railways (AOC-55);
- Former Plating Operations and Other Metal Treating Operations (AOC-56);
- Former Boilers, Ovens, Furnaces, and Incinerators (AOC-57);
- Fill areas other than Old Landfill (AOC-58);
- Roof/Process Vents and Roof Drains (AOC-59); and
- Former Outdoor Scrap Pads, Storage Areas, and Process Areas not previously identified (AOC-60).

Based on standard preliminary assessment categories, several additional potential AOCs were also identified, but based on documentation available, did not appear to pose an environmental concern. Details of these AOCs are included in Appendix M.

Investigative activities have already been initiated at the former Coal Trestle (AOC-46) and locations of former X-ray equipment (AOC-47). Additional investigations are recommended to determine if and how the former mine (AOC-48) was closed and to determine soil quality at former pond locations (AOC-51). Regarding the other potential AOCs, ENSR's recommendations are detailed in Section 5.0

Appendix M details the identification of potential AOCs and provides recommendations, as appropriate, for each. The following Section provides an investigative workplan based on the recommendations in Appendix M.



## 5.0 PROPOSED INVESTIGATIVE WORKPLAN

As previously indicated, it is IRs goal to identify and delineate impacts across the site for inclusion into a site-wide deed notice or to address via other remedial methods.

Based on the AOCs identified in Section 4.0 and Appendix M, additional sampling is warranted to characterize potential areas of concern remaining at the site. However, as indicated in Appendix M, potential AOCs were identified in nearly all of the PA categories at locations across the facility property. Of the potential AOCs identified, several have previously been investigated as individual AOCs or historic investigations have been conducted within a proximity to the AOC as to address potential impacts related to those AOCs. Other potential AOCs have been identified in areas of the facility property which have not been investigated. Based on the complex nature of this site, the extent of changes to the site layout and location of site operations throughout site history, and the extent of investigative activities to date, ENSR proposes that further investigative activities be conducted, where appropriate, on a grid-basis as detailed investigation into all potential AOCs identified at the facility pursuant to N.J.A.C.7:26E would be cost prohibitive.

### 5.1 Petition for Variance

Based on the proposal of investigative methodologies differing from those described in N.J.A.C.7:26E, a petition for variance from the Technical Requirements for Site Remediation is required. This petition for variance is presented as follows.

Petition Submitted By:

ENSR Corporation (ENSR) on behalf of Ingersoll Rand Company (IR).

Remediation to be Conducted By:

ENSR  
20 New England Avenue  
Piscataway, New Jersey 08854

Site Owner/Operator:

Current Owner:

Preferred Real Estate Investments, Inc.  
d/b/a/ Phillipsburg Associates, L.P.  
1001 East Hector Street, Suite 100  
Conshohocken, PA 19428

Former Owner:

Ingersoll Rand Company  
155 Chestnut Ridge Road  
Montvale, New Jersey 07645

Site Operator(s):

Flow Serve Corporation  
942 Memorial Parkway  
Phillipsburg, NJ 08865

Stateline Fabricators, Inc.  
P.O. Box 619  
Phillipsburg, NJ 08865-0619

Village Bus Company, Inc.  
942 US Highway 22  
Phillipsburg, NJ 08865

Street Address & Block and Lot Designation:

942 Memorial Parkway  
Phillipsburg, NJ 08865  
Block 3201, Lot 7

Description of Variance:

As discussed in Appendix M and in Section 5.0, additional AOCs have been identified pursuant to N.J.A.C.7:26E-3.1 *et. seq.*, which would require sampling pursuant to N.J.A.C.7:26E-3.4, 3.5, 3.6, and 3.9. However, based on the amount of individual AOCs, their proximity to one another and to areas that have been previously sampled due to the presence of other AOCs, we believe that the project objectives will be met through grid sampling in areas not previously sampled with bias toward locations of known potential AOCs. Areas selected for grid sampling and proposed grid intervals are detailed in Section 5.2.

Additionally, we understand that several potential AOCs should be investigated per N.J.A.C.7:26 and have endeavored to separate those AOCs in the proposed site investigation work plan in Section 5.2. However, ENSR specifically requests a variance for sampling requirements under N.J.A.C.7:26E-3.9e-iii, where only one representative sample of sludge/sediment from cesspools and dry wells is proposed to confirm that only sanitary or stormwater discharges were released to these structures.

## 5.2 Proposed Site Investigation Work Plan

### 5.2.1 *Grid-Based Soil Sampling Requiring Variance*

As shown in Figure 4, ENSR proposes grid sampling in the Cameron area. Grid-based soil sampling is proposed throughout the Cameron area at 100-foot spacing. Soil borings will be conducted at every other grid node and may be adjusted based on known locations of potential AOCs. As shown, a total of 44 soil borings will be collected in this area. Soil borings will be screened with a photoionization detector (PID) and logged by an ENSR geologist. Samples will be collected based on field indications of potential impacts. In the absence of observable impacts, soil samples will be collected from the surface or from the soil immediately underlying the concrete slab and bedding material present over much of the area. When soil borings are conducted in the vicinity of potential AOCs soil samples will be biased to areas of suspected impact or depths corresponding to the base of the potential AOC (e.g., at the suspected invert elevation of an UST).

As shown on Figure 5, ENSR proposes that a 50-foot grid be established in a 400x200-foot area around the former building foundation of Building #23. Soil borings would be conducted at every other grid node for a total of 16 soil boring locations. Each soil boring will be advanced to 8-12 feet below ground surface and screened continuously with a PID. Soil will be characterized and logged by an ENSR field geologist and samples will be collected based on field indications of potential impact. In the absence of observable impacts, soil samples will be collected from the surface or from the soil immediately underlying the concrete slab and bedding material present over much of the area. When soil borings are conducted in the vicinity of potential AOCs soil samples will be biased to areas of suspected impact or depths corresponding to the base of the potential AOC (e.g., at the suspected invert elevation of an UST).

As shown on Figure 6, ENSR proposes that a 100-foot grid be established over a 300x800-foot area encompassing former buildings #20, 21, 22, and #24. Soil borings are proposed at alternating grid node for a total of 18 soil borings. Each soil boring will be advanced to 8-12 feet below ground surface and screened continuously with a PID. Soil will be characterized and logged by an ENSR field geologist and samples will be collected based on field indications of potential impact. In the absence of observable impacts, soil samples will be collected from the surface or from the soil immediately underlying the concrete slab and bedding material present over parts of this area. Grid nodes that are located within Building #20 will be moved to an appropriate location to help satisfy sampling recommendations for potential impacts related to activities formerly conducted at this building. When soil borings are conducted in the vicinity of potential AOCs, soil samples will be biased to areas of suspected impact or depths corresponding to the base of the potential AOC (e.g., at the suspected invert elevation of an UST).

As shown on Figure 7, ENSR proposes that a ENSR proposes that a 50-foot grid be established over a 150x550-foot area north of former Building #4 encompassing the former pattern storage buildings

and the east side on Building #3. Soil borings are proposed at alternating grid nodes for a total of 24 soil borings. Each soil boring will be advanced to 8-12 feet below ground surface and screened continuously with a PID. Soil will be characterized and logged by an ENSR field geologist and samples will be collected based on field indications of potential impact. In the absence of observable impacts, soil samples will be collected from the surface or from the soil immediately underlying the concrete slab and bedding material present over parts of this area. When soil borings are conducted in the vicinity of potential AOCs, soil samples will be biased to areas of suspected impact or depths corresponding to the base of the potential AOC (e.g., at the suspected invert elevation of an UST).

### **5.2.2 AOC-Based Investigations**

As previously discussed and detailed in Table 3, ENSR recommends additional investigation for several specific AOC locations corresponding to the former coal trestle (AOC-46); former X-ray areas (AOC-47); the former onsite mine (AOC-48); current and historic transformer locations (AOC-49); dry wells, cesspools, pits and leachfields (AOC-50); former onsite ponds (AOC-51); building sumps, pits, and floor drains (AOC-52); subsurface utilities (AOC-53); bulk storage tanks (AOC-54); former rail lines (AOC-55); locations of former plating operations (AOC-56); locations of boilers, ovens, furnaces, and incinerators (AOC-57); areas of fill (AOC-58); former process vents and roof drains (AOC-59); and former scrap pads, storage pads, and process areas (AOC-60).

#### **5.2.2.1 Former Coal Trestle and Coal Storage Areas (AOC-46)**

As discussed in Appendix M, thirteen coal storage areas were identified across the site. Of these, only the large coal trestle located at the eastern side of the site south of the bulk storage AST farm was recommended for further investigation; other areas would be addressed by previous sampling, or grid sampling proposed in Section 5.2.1 except for one former coal box located south of former Building #31 – the former Memorial Parkway Gatehouse.

The main coal trestle super-structure has been removed leaving its foundation under a few feet of fill. ENSR has begun activities to investigate potential impacts related to coal storage in this area by the placement of three soil borings along a raised area in the eastern part of the site, where the former coal trestle foundation is located. An additional six soil borings were conducted around the perimeter of the former coal trestle location in an attempt to delineate potential impacts related to the storage of coal. Samples were analyzed for TPHC, BN+15, and PP-metals. Results of this investigation will be submitted to NJDEP in a forthcoming report.

ENSR proposes one additional soil boring at the former coal box south of former Building #31. The soil boring will be advanced to 4 to 8 feet below ground surface and screened by an ENSR geologist. One soil sample will be collected based on field observation or from the 0-0.5-ft interval. The soil sample will be submitted to a NJDEP-certified laboratory for PP+40 minus pesticides and herbicides.

#### **5.2.2.2 Former Locations of X-Ray Equipment (AOC-47)**

As discussed in Appendix M, three facility buildings were known to house and operate X-Ray diagnostic equipment; the former Hospital and Dispensary (Building #27), the former Radiograph Building (Building #60), and a former dispensary area in Building #20. Based on information provided to ENSR by equipment manufacturers, no radiological source material would have been used in X-Ray machines.

To verify, ENSR initiated a radiological sweep of the former x-ray areas using a Ludlum Model 3 radiation meter. Results of the investigation indicated that no radiological source material was present in any of the identified areas. Detailed results will be presented in a forthcoming report.

#### **5.2.2.3 Former Mine (AOC-48)**

As discussed in Appendix M, the facility apparently operated a mine for the testing and development of mining and related equipment. It is anticipated that the mine was abandoned in the 1950s and closed between 1974 and 1981. Because no formal records were identified to document the proper closure of the mine, ENSR proposes that additional activities be conducted to verify how the mine was closed. Proposed investigative activities are as follows:

- Review of local records in the town of Phillipsburg to determine if documentation was filed with the town. If appropriate abandonment records are uncovered, no further action would be proposed.
- If no abandonment records are identified, a limited investigation into the former mine would be conducted. ENSR proposes that the former mine shaft be located at the site and surface investigation of the area be conducted to assess if the mine shaft had been filled during closure.
- If the mine shaft appears filled, ENSR proposes that a sample of the fill material be collected at a depth corresponding to ½ the depth of the mine shaft and analyzed for PP+40 minus pesticides/herbicides.
- One additional soil boring is proposed at a location selected to intersect a former mine drift to determine if the drifts were filled. If filled, another soil sample will be collected and analyzed.
- In the instance that the mine is found not to be filled, ENSR proposes no environmental investigation. However, closure of the mine according to current mining regulation would be recommended to the property owner.

#### **5.2.2.4 Former and Current Transformers (AOC-49)**

Based on historical review, ENSR identified 73 locations which currently or formerly contained transformers or capacitors. The most recent inventory of oil containing electrical equipment, included in Appendix M, indicated the presence of 89 separate units in 38 areas. Based on the seven current

locations which contain PCB-impacted fluid and the possibility of the former transformer locations to have contained and released PCB-impacted oil, additional investigation is warranted. However, due to the amount and distribution of the current and former transformers, ENSR does not recommend sampling each location per N.J.A.C.7:26E regulation. Instead, based on the sampling conducted to date as well as the additional sampling recommended in this report, ENSR recommends the following:

- Conduct grid-based sampling as proposed in Section 5.2.1 and adjust locations, where applicable, to place soil borings near former transformer locations;
- No additional sampling is proposed near transformers located in the vicinity of areas which have been sampled for PCB;
- No sampling is proposed for current transformer locations that are inspected as part of the facility SPCC plan except at the main transformer yard where ENSR recommends a limited surface soil investigation to assess potential impacts.
- The limited surface soil investigation at the main transformer yard will include four soil borings up to four feet in depth. Each soil boring will be characterized by an ENSR geologist and one soil sample will be collected from the 0-0.5' interval unless field indications indicate potentially deeper impacts.

#### **5.2.2.5 Former Dry Wells, Cesspools, and Leachfields (AOC-50)**

As reported in Appendix M, five cesspools, six septic tanks, and three pits were identified as part of possible septic systems. An additional 15 potential dry wells and sumps were also identified. No leachfields were identified at any location on the site. It appears that one group of septic tanks was encountered during investigations conducted circa 1995 and were removed. These activities were documented in the 1995 Status of the Remedial Investigation/Remedial Action on the Buried No.2 and No.6 Fuel Oil Lines. One sump, located in Building #16 was identified as AOC-45 and investigated during accelerated soil investigation activities in 2003 and 2004. Results of this investigation will be presented in a forthcoming Soil Remedial Investigation Report. The status of the remaining structures is unknown. ENSR proposes conducting one soil sample of sludge and/or sediment from the bottom of each located structure to verify that only sanitary and stormwater were discharged at these locations.

#### **5.2.2.6 Current and Former Onsite Ponds (AOC-51)**

As indicated in Appendix M, at least seven man made ponds have been present at the site and several ponds were caused as a result of the development of sinkholes. Two previous ponds on the western side of the site have been replaced with the current stormwater retention basin and soil in the vicinity has been investigated as part of AOC-17. As such, no additional investigation is proposed.

The Spray Pond and two Inverse Ponds (AOCs 30 and 31) are being addressed under the previously identified AOCs and no additional investigation is proposed.

Two former Inverse Ponds located southwest of Building #1 were filled in the 1980s. No investigative activities have take place at these locations or in the immediate vicinity. As such, ENSR proposes that two soil borings (one at each pond) to be conducted at the former locations these structures. Soil borings are proposed to be extended approximately 20 feet and samples collected based on field observation.

Due to the development of sinkholes east of the Spray Pond, several of these features filled with water discharged from the Spray Pond. These features were removed in the early 1980s during the construction of Loop Road. Currently the former locations of these features are buried under the steep slopes of the fill used to provide a base for Loop Road and are generally inaccessible. Based on facility information, the sinkholes were dug-out prior to being filled. As such, ENSR proposes no investigative sampling at these locations, but proposes they are included in a Deed Notice.

#### **5.2.2.7 Building Sumps, Pits, and Floor Drains (AOC-52)**

Sumps, pits, and floor drains were identified at many facility buildings during ENSR's document review and likely existed at many other facility structures historically. These structures likely drained to the sanitary sewer. Due to the lack of historical documentation and the extent of sampling previously conducted as well as the proposed sampling presented herein, ENSR proposes no additional investigation into these structures.

#### **5.2.2.8 Subsurface Utilities (AOC-53)**

As discussed in Appendix M, sub-grade sewerage has existed across the site and has served all buildings current and historic. Over the years, it appears that sections were abandoned or replaced, added to or diverted. A complete history of these structures was not able to be reproduced based on the documentation available. ENSR proposes that the investigative sampling conducted to date as well as the sampling proposed herein be used to characterize potential impacts related to these structures.

#### **5.2.2.9 Former ASTs and USTs (AOC-54)**

As documented in Appendix M, this group of AOCs included all above and below ground storage tanks, silos, rail cars, loading and unloading areas and associated piping. A total of 172 above or below ground tank areas were identified across the site. Based on the location of these tanks, sampling is proposed as follows.

- In the Bulk Storage AST farm, a limited soil investigation is proposed and will consist of six soil borings advanced through the secondary containment liner to the bedrock surface. Soil samples collected from surface (below the liner) and from areas of observed impact.

- In the Foundry area, sampling has been conducted during investigative activities under AOC-17. Due to the presence of metals and PAHs identified in excess of applicable soil cleanup criteria, additional sampling has been conducted throughout the northwestern portion of the site. As such, ENSR proposes no additional investigation in this area.
- In the Cameron area, ENSR proposes a grid based sampling structure as described in Section 5.2.1. Where possible, grid sampling locations will be modified to address potential tank locations. No individual sampling of tanks in this area is proposed.
- Tanks present at the northern side of the main facility buildings have been addressed as individual AOCs or have been addressed by sampling conducted in support of investigative activities at AOC-16. Sampling in this AOC has identified impacts of TPHC, BN, PCB, and metals in excess of applicable soil cleanup criteria and has been largely delineated. As such, no additional investigation is proposed for tanks identified in these areas.
- At the northeastern portion of the facility, near former Building #23, several additional tanks were identified. Since no sampling had been conducted in this location and several additional AOCs have been identified in the vicinity, ENSR proposes that this area is investigated using a grid-based sampling methodology as described in Section 5.2.1.
- No additional investigation is proposed for tanks located at the southeastern and southern sides of the main facility buildings as these locations have been addressed as AOCs previously, by previous sampling at other identified AOCs, or existed in areas above concrete slabs that do not show evidence of staining.
- West of Building 17, additional tanks were identified along with several additional AOCs, ENSR proposes that this area be investigated using a grid-based sampling methodology as described in Section 5.2.1.
- One AST located adjacent to former Building #105 was addressed as AOC-9; however documents indicate that a UST was present at that location. ENSR proposes that a field investigation be conducted in the vicinity of former Building #105 to determine if a UST is present.

As indicated in Appendix M, no additional sampling has been proposed for rail cars, silos, and piping related to the bulk storage tanks. Previously conducted soil sampling and sampling proposed herein, will be used to address potential impacts related to these structures.



#### **5.2.2.10 Former Railroads (AOC-55)**

As discussed in Appendix M, railroad tracks were present across the facility and were routinely moved for various reasons. Tracks may have been built on fill material and historical interviews suggest that waste oil and solvents may have been historically used as weed suppressant around tracks. Presently, most of the tracks have been removed. Acknowledging potential impacts around these features, ENSR proposes that no additional sampling is conducted and that previously conducted sampling, as well as the soil sampling proposed, will be used to address potential impacts related to these structures.

#### **5.2.2.11 Former Plating Operations (AOC-56)**

As identified in Appendix M, ENSR identified six locations in which plating operations had historically been conducted. Former plating operations in the Cameron Area will be addressed by grid sampling as proposed in Section 5.2.1. Former plating operations in the Drill Division (northern portion of main facility buildings) has been addressed by previously conducted sampling from AOC-10 and AOC-16 except for a possible former plating area in Building #20, located west of former Building #17. ENSR proposes that grid sampling to be conducted west of the main facility buildings as described in Section 5.2.1 to address this potential plating operation.

#### **5.2.2.12 Former Boilers, Ovens, Furnaces, and Incinerators (AOC-57)**

As indicated in Appendix M, seven possible incinerator sites were identified during historic review of facility operations. Two incinerators formerly located in the Foundry Area. Based on sampling conducted in the Foundry in support of investigation at AOC-17, ENSR proposes that previous sampling be used to characterize potential impacts from these locations and that no further investigation is necessary.

Three incinerator sites were previously identified and have been addressed as AOC 23, AOC-33, and AOC-34. No additional investigation is proposed.

The remaining two incinerators appear to have been located in the vicinity of Building #17. A grid based SI sampling approach, approved in the 1994 Draft RIWP has already been implemented across this area and has identified several impacts which are being addressed as AOC-16. As such, ENSR proposes no additional investigation into the two incinerators near Building #17.

#### **5.2.2.13 Locations of Fill Material (AOC-58)**

Fill material has been identified across the site as shown in Figure 3 and described in Appendix M. Specifically a possible waste pile or trash dump was identified east of Building #13 but field observation and sampling conducted in the vicinity of the possible dumping area did not provide any evidence of

the existence of a dump at that location. Further, an Old Landfill, described in more detail in Appendix L and M, is located at the southeast corner of the facility and is being addressed as AOC-29. No additional investigation is proposed at that AOC. A New Landfill, also discussed in Appendix L and M is present to the west of the Old Landfill and east of the former Cameron Area. This landfill is permitted and in compliance with current regulation. No additional investigation is proposed.

As described in Appendix L, it appears that spent foundry sand was used as fill material in many areas of the site in effort to raise grade or provide fill for various construction projects. Based on sampling conducted to date, it appears that the foundry sand is impacted sporadically with metals and PAHs. However, based on the sampling conducted to date as well as the sampling proposed herein, ENSR believes that these potential impacts are being addressed in other AOCs and no additional investigation is proposed.

Finally, three areas were identified in aerial photographs to be discolored; apparently due to the presence of fill overlying some feature. One, the former coal trestle is being investigated as AOC-46; another north of Building #17A is being investigated under AOCs -16, -33, 3E, 3F, and -4. No additional investigation is being proposed at these locations. A discolored area at the western portion of the site was identified in recent aerial photographs and appears to be the location of a former parking area. Because no sampling has been conducted in this area previously, ENSR proposes that two soil borings be conducted in discolored area at the western site boundary to assess if asphalt remains under the surface, to assess the fill quality above the asphalt and soil quality below, and to assist in delineate of remaining impacts toward in AOCs located toward the east.

#### **5.2.2.14 Former Roof Process Vents and Roof Drains (AOC-59)**

As discussed in Appendix M, many buildings had air vents and ducts that released to the roof or other outdoor locations where deposition and runoff may have had the potential to occur. However, based on the soil sampling conducted to date as well as the sampling proposed herein, ENSR proposes no additional investigation into this AOC.

#### **5.2.2.15 Former Scrap Pads, Storage Areas, and Process Areas with Potential to Impact Environmental Quality at the Site (AOC-60)**

As indicated in Appendix M, AOC-60 comprises many areas including storage pads, chemical storage closets, process area sinks, hazardous material storage and handling areas, waste treatment areas any building interiors with potential to discharge to the environment, as well as other operational areas such as cleaning and degreasing areas, the "gun club" building, etc. Based on a review of these areas, nearly all can be addressed by previously conducted sampling or the sampling proposed herein. Locations which have not been addressed or should be assessed individually are as follows.

- A former lubricating oil store room was located the corner of Buildings #7 and #8. ENSR proposes that one soil boring be conducted at this location at to assess soil quality related to the former store room. The boring will be advanced to approximately 12 feet below grade and soil samples will be collected based on field observations.
- Based on former operations at Building #20 (Hammerdrill Manufacturing), ENSR proposes a grid-based sampling of this area as described in Section 5.2.1 to verify soil quality in the vicinity of the former hammer drill building.
- A solvent storage area was identified south of Building #9. Based on the groundwater impacts southeast of this area, ENSR proposes that investigative activities be conducted in this area. ENSR proposes that a soil gas survey be conducted in the vicinity of the former storage area followed by a soil investigation consisting of five soil borings to the bedrock surface. Soil borings would be located based on the results of the soil gas survey or, in the absence of evidence of impact from the soil gas survey, will be conducted at the center and around the perimeter of the former structure.
- An area located east of Building #16 was identified in a 1966 facility drawing as the “East Field Test Area”, in which a concrete pad featured four recessed boxes constructed similar to drywells. It is unknown what was tested in this area and no sampling has previously been conducted in the vicinity. As such, ENSR proposes that four soil borings be conducted in the “East Field Test Area” east of Building #16 to assess soil quality. Soil borings will be placed near the former recessed boxes as can be determined from the 1966 drawing and will be completed to the bedrock surface. Soil samples will be collected at eight feet or at locations of observable impact.

### **5.3 Continued Remedial Activities Planned at Previously Identified AOCs**

The focus of this section has been on the investigation of newly identified AOCs 46 through 60. However, 45 AOCs have previously been identified and several require additional activities. Table 2 presents a summary of these AOCs as well as their current status. Based on sampling and analysis presented in the 2004 Soil Remedial Investigation Report, ENSR has proposed that no further investigation is required for several previously identified AOCs. The following is a summary of proposed activities for those AOCs that require additional activities.

#### **5.3.1 AOC-2 Spray Pond Sludge Disposal Area**

As described in ENSR’s July 11, 2003 letter Re: Waste Classification Sampling Plan & Soil Reuse Sampling Plan, ENSR proposes to excavate and dispose of this material at an approved offsite disposal facility. Upon removal, post excavation soil samples will be conducted based on the sampling frequency dictated by N.J.A.C. 7:26E.

### **5.3.2     AOC-3C&D (Former Chip Pads)**

Based on soil analytical results presented in the 2004 Soil Remedial Investigation Report, ENSR recommends that sampling be conducted to delineate metals impacts toward the west and north, and that the AOC boundaries be connected with neighboring AOCs and/or nearby structures. This sampling can be conducted in the grid sampling proposed in 5.2.1, which will take place to the north of this area and by sampling to be conducted to assess soil quality at a discolored area at the western border of the site (see Section 5.2.2.13).

### **5.3.3     AOC 3F (Former Chip Pad)**

Based on analytical results presented in the 2004 Soil Remedial Investigation Report, ENSR recommends that sampling be conducted to delineate impacts to the north as well as vertically as one former sample location. ENSR proposes additional borings to complete this delineation.

### **5.3.4     AOC-5 (Soil Pile)**

As described in ENSR's July 11, 2003 letter Re: Waste Classification Sampling Plan & Soil Reuse Sampling Plan, ENSR proposes to reuse this material onsite. ENSR will provide NJDEP with the results of soil samples collected pursuant to the above document in a forthcoming soil reuse plan.

### **5.3.5     AOC-30 (Spray Pond)**

No further action was proposed for sediment remaining in the Spray Pond in a letter dated December 20, 1999. To date, no response has been received from NJDEP. However, based on the sale of the property, IR has agreed to remove the remaining sediment and dispose of the material at a permitted offsite disposal facility.

### **5.3.6     AOC-31 (Inverse Ponds)**

It is Ingersoll-Rand's intent to close the inverse ponds and re-direct the spray pond out flow directly into the ephemeral stream. Ingersoll-Rand is currently completing permit applications in order to proceed with this activity. As such, ENSR proposes to evaluate options concerning the closure and removal of the ponds at AOC-31. Following the removal of the ponds, remedial investigation sampling activities will be conducted to better evaluate the soil quality at each pond's invert and to delineate impacts to underlying soil strata. At this point remedial actions such as soil excavation will be evaluated and remaining impacts, if any, will be addressed under a deed notice.

#### **5.3.7 AOC-36 (Soil Pile)**

As described in ENSR's July 11, 2003 letter Re: Waste Classification Sampling Plan & Soil Reuse Sampling Plan, ENSR proposes to reuse this material onsite. ENSR will provide NJDEP with the results of soil samples collected pursuant to the above document in a forthcoming soil reuse plan.

#### **5.3.8 AOC-43/44 (Groundwater LNAPL and Dissolved Phase)**

ENSR is continuing investigative activities proposed in the 2002 Groundwater Remedial Investigation Workplan, the 2003 Annual Groundwater Monitoring Report and Supplemental Groundwater Remedial Investigation Report, and the 2004 Response to NJDEP Dated October 28, 2003. Based on the status of the 1903 production well described in Appendix M of this report, ENSR proposes that investigation into the existence of this well be included in this AOC.

## **TABLES**

**TABLE 1**  
**SUMMARY OF SITE BUILDINGS**  
**Site History Report - October 2004**  
Former Ingersoll-Rand Facility  
Phillipsburg, New Jersey

BUILDING ID	Alt ID	Office	Date	NOTE	USE
1	-	Pattern Shop	1903	Construction	Pattern making
1	-	Pattern Shop	1952	Additions in 1926 and 1929	Pattern making
1	-	Pattern Shop	1987	1970's had associated transformer	Pattern making
1	-	Pattern Shop	1994	1980s included fiberglass room	Pattern making
1	-	Storage / vacant	2000	-	unused
2	-	Construction	1903	-	Pattern storage and core making
2	-	Pattern Storage	c.1925	addition to N. (bldg #N demo'd)	Pattern storage and core making
2	-	Pattern Storage	1920s	Minor additions in 1920, 1929	Pattern storage and core making
2	-	Pattern Storage	1930s	Minor additions in 1930, 1936	Pattern storage and core making
2	-	Pattern Storage	1940s	Minor additions in 1949	Pattern storage and core making
2	-	Pattern Storage	1952	some additions	Pattern storage and core making
2	-	Pattern Storage	1987	-	Pattern storage
2	-	Pattern Storage	1994	-	Pattern storage
3	-	Cleaning (Casting)	1903	Construciton	Casting Cleaning
3	-	Casting Cleaning	c.1913	Addition to North	Casting Cleaning
3	-	Casting Cleaing	c. 1925	Temporarily identified as Brass Foundry	Casting Cleaning
3	-	Brass Foundry	c.1930s	Additions in 1929 and 1930	Brass Foundry & possible Pickling operations in 1930s
3	-	Casting Cleaning / Brass Foundry	1940-41	Addition. Shed to W.	Foundry
3	-	Aluminum and Brass Foundry	1952	-	Brass, Aluminum, Iron Foundry
3	-	Aluminum and Brass Foundry	1957	Structural, Architectural, Electrical Extensions	Aluminum and Brass Foundry
3	-	Aluminum and Brass Foundry	1965	New core room added on W side	Aluminum and Brass Foundry
3	-	Aluminum and Brass Foundry	1966	NW extension to building 3	Aluminum and Brass Foundry
3	-	Aluminum and Brass Foundry	1968	Met lab addition	Aluminum and Brass Foundry
3	-	Aluminum and Brass Foundry	1969	Additions 1957, 1967, 1969, and possibly in 1970s	Aluminum and Brass Foundry
3	-	Steel Foundry	1987	-	Steel Foundry
3	-	Steel Foundry	1994	-	Steel Foundry
3	-	Building #3	1990s	Decommissioned	Vacant
4	-	Construction	1903	-	Iron Foundry
4	-	Iron Foundry	c.1925	Multiple minor additions and connection to Bldg #30A	Iron Foundry
4	-	Iron Foundry	1940s	Additions to Sand Mixing Room, New Core Oven installation, and Extension to Coke Bins	Iron Foundry
4	-	Iron Foundry	1952	some additions	Iron Foundry
4	-	Iron Foundry	1970s	Some additions	Iron Foundry
4	-	Building #4	1987	Decommissioned	Vacant
4	-	Building #4	1988-1989	Demolished	-
5	-	Carpentry Shop	1903	Construction	Carpentry Shop
5	-	Cafeteria	1932	Converted to facility cafeteria	Cafeteria
5	-	Cafeteria	1952	Some additions	Cafeteria
5	-	Cafeteria	1973	Renovations in Kitchen area and toilet facilities	Cafeteria
5	-	Hygenist Lab	1976	Renovated	Hygenist Lab
5	-	General Office	1980	Renovated	Administrative
5	-	General Office	1987	-	Administrative
5	-	General Office	1994	-	Administrative
5	-	Building #5	1997	Demolished and placed in LF	-
6	-	Office	1904	Construction	Office
6	-	Office	bet 1919 & 1922	Addition to S. side	Administrative
6	-	Office	c.1933	S. extending addition	Administrative
6	-	Office	1940	main office extension	Administrative
6	-	General Office	1952	-	Administrative
6	-	General Office	1987	Most of original structure demolished, leaving substructure	Administrative
6	-	Telephone Room	1994	-	Administrative

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BUILDING ID	Alt ID	Office	Date	NOTE	USE
7	-	Shipping and Painting	1904	Construction	Shipping and Painting
7	-	Shipping and Painting	c.1925	Additions in 1920, 1927, 1928, & 1929	Shipping and Painting
7	-	Shipping and Painting	1944	extension to N end leanto	-
7	-	Shipping	1952	Addition #7E	Shipping, assembly, and storage
7	-	Compressor Mfg and Office	1970	estimated date	Compressor Mfg. and Administrative
7	-	Compressor Mfg and Office	1980	Renovation of shop locker room into vendeteria	Compressor Mfg. and Administrative
7	-	Compressor Mfg and Office	1987	-	Compressor Mfg. and Administrative
7	-	Navy Test	1994	Conversion to pump support some time after 1980	Pump Testing
8	-	Compressor Erecting	1904	Construction	Compressor Erecting
8	-	Compressor Erecting	c.1925	Extension of #8 N of Bldg.#25	Compressor Erecting
8	-	Compressor Erecting	1956-1958	Structural extensions comprising #8B, 8C, and 8E. Additions of cranes.	Compressor Assembly
8	-	Assembly and Test	1987	-	Compressor Assembly
8	-	Assembly and Test	1994	-	Compressor Assembly/Shipping
9	-	Compressor Manufacturing	1904	Construction	Compressor Manufacturing
9	-	Compressor Mfg.	c.1915	200' extension to south	Compressor Manufacturing
9	-	Compressor Mfg.	c.1929	Extension to south and to tool room (1931)	Compressor Manufacturing
9	-	Compressor Machine Shop	1952	some additions	Compressor Machine Shop
9	-	Machine Shop	1970s	Sandblast building added between #9 and #11	Compressor Machine Shop
9	-	Machine Shop	1987	-	Compressor Machine Shop
9	-	Machine Shop	1994	-	-
10	-	Compressor Erecting	1904	Construction	Compressor Erecting
10	-	Compressor Erecting	c.1915	200' extension to south w/ "oil room". File index indicates extension in 1926, 1930, & 1938.	Compressor Erecting
10	-	Compressor Erecting	1943	Horizontal Boring Machine Installed	Compressor Erecting
10	-	Compressor Assembly	1952	New storage bins located at SE corner; Extension to crane runway.	Compressor Erecting
10	-	Compressor Machine Shop	1952	Additions #10A, 10B, and 10D	Compressor Erecting
10	-	Machine Shop	1987	-	Machine shop
10	-	Machine Shop	1994	-	Machine shop
11	12	Construction	1905	-	Engine House
11	12	Engine House	c.1945	redesignated #12E	Engine House
11	-	Construction	c.1945	-	Compressor Assembly
11	-	Compressor Assembly and Storage	1952	-	Compressor Assembly
11	-	Compressor Assembly and Storage	1970s	Sandblast building added between #9 and #11	Compressor Assembly
11	-	Machine Shop	1987	-	Machine shop
11	-	Machine Shop	1994	-	Machine shop
12	-	Boiler Room	1905	Construction	Boiler House
12	-	Boiler House	c.1925	Additions	Boiler House
12	-	Boiler and Engine Room	1952	combined with Building #11 Engine House	Power House
12	-	Powerhouse	1987	-	Power House
12	-	Powerhouse	1994	-	Power House
13	-	Forge Shop	1905	Construction	Forge Shop
13	-	Forge Shop	c.1915	Additions to south of structure, Scrap shed, 2-8K gal USTs, and Picking shed to N.	Forge Shop
13	-	Forge Shop	c.1925	3-8K gal fuel oil USTs @ NE corner. Addition to North	Forge Shop
13	-	Forge/Blacksmith Shop	1952	-	Forge Shop
13	-	Machine Shop/Test	1987	-	Machine shop
13	-	Machine Shop/Test	1994	-	Machine shop



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BUILDING ID	Alt ID	Office	Date	NOTE	USE
14	-	Tempering Building	1905	Construction	Heat Treat / Tempering Bldg
14	-	Heat Treating	c.1925	Addition. S 2-10K gal quench oil tanks below cooling shed. 3rd UST S and Acetylene House W.	Heat Treat / Tempering Bldg
14	-	Heat Treat Building	1952	Addition #14B	Heat Treat / Tempering Bldg
14	-	Heat Treat (Vacant)	1987	-	Vacant
14	-	Building #14	1989	Demolished	-
15	-	Drill Testing	1905	Construction	Drill Testing
15	-	Drill Testing	c.1915	Addition of oil mixing and cylinder building between #15 and #17	Drill Testing
15	-	Building #15	1952	Process changed in 1940s	Plating
15	-	Chrome Plating/ Welding (Vacant)	1987	-	Plating, degreasing, parkerizing
15	-	Building #15	1989	Demolished	-
16	-	Warehouse	1905	Construction	Warehouse/Storage
16	-	Quarry Master Mfg.	1952	Addition/extention to E.	Master Drill Assembly
16	-	Building #16	1987	-	Assembly/Test
16	-	Building #16	1994	-	Assembly/Test
16	-	Building #16	2003-2004	Leased to Stateline Fabricators	Structural Steel Fabrication
17	-	Drill manufacturing	1905	Construction	Drill Manufacturing
17	-	Drill manufacturing	c.1915	Addition of oil mixing and cylinder building between #15 and #17	Drill Manufacturing
17	-	Drill manufacturing	1952	-	Drill Manufacturing
17	-	Drill manufacturing	1960s	Northern addition	Drill Manufacturing
17	-	Building #17	1989	Slab paved and turned into parking area	Parking
17A	-	Building #17A	c.1965	Construction of addition/annex to Bldg #17	Assembly / Administrative
17A	-	Building #17A	1987	Helipad installed to NE. Nearby incinerator removed	Assembly / Administrative
17A	-	Building #17A	1994	-	Storage
17B	-	Building #17B	1980	Construction	Manufacturing/testing/storage
17B	-	Building #17B	1987	-	Manufacturing/testing/storage
17B	-	Building #17B	1994	-	Gym, Storage, Laser Lab
18	-	Oil House	1905	Construction	Oil House
18	-	Oil House	c.1919	Demolishion	-
18	-	Foam House	c.1919	Construction	Foam House associated with Tank #79
18	-	Foam House	1952	-	Foam House
18	-	Foam House	1987	-	Foam House
18	-	Foam House	1994	-	Foam House
19	-	Shear Shop	c.1918	Construction - File index indicates a 1905 Construction	Shear Shop
19	-	Forge Office and Shear Bldg.	1952	-	Shear Shop / Administrative
19	-	Office (Vacant)	1987	-	Administrative
19	-	Office	1994	-	Administrative
20	-	Hammerdrill/Machine Shop	c.1913	Construction - File index indicates a 1905 construction	Hammerdrill/Machine Shop
20	22A	Hammerdrill/Machine Shop	c.1925	Addition #22A between #20 and #22	Hammerdrill/Machine Shop
20	-	Hammer Drill Dept.	1952	-	Hammerdrill
20	-	General Office	1987	-	General Office
20	-	General Office	1994	-	General Office
20	-	Bentley Building	2000	-	Administrative and Storage
21	-	Hardening	c.1915	Construction	Hardening
21	-	Hardening	c.1922	2-10K gallon USTs and pump house adjacent on E	Carpenter shop, tin shop, and die staging area
21	-	Hardening	c.1922	E. is a Wheelbarrow Shed (demo'd in late 20s	Carpenter shop, tin shop, and die staging area
21	-	Maintenance Dept.	1952	-	General Maintenance
21	-	Maintenance Dept.	1970s	Connected to #22	General Maintenance
21	-	Building #21	1980s	Demolished	-

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BUILDING ID	Alt ID	Office	Date	NOTE	USE
22	-	"Stone" Building	c.1913	Construction	Unknown
22	-	Drill Engineering Test Dept.	1952	-	Drill Test
22	21	Drill Test	1970s	Addition connects to #21 and combined Building named #21	Drill Testing
22	-	Building #22	1970s	Demolished	-
22	-	Pump Test Pit	1980	Construction	Pump Testing
22	-	Pump Test Pit	1987	-	Pump Testing
22	-	Pump Test Pit	1994	-	Pump Testing
23	-	Annealing Department	c. 1915	Construction	Annealing Dept / Quench Oil Pump House
23	-	Annealing Department	c.1925	several small additions w/ generator house to NE	Annealing Dept / Quench Oil Pump House
23	-	Sandblast and Jackbit Mfg.	1952	Separate additions 23C and 23D N of #23 replace sheds.	Heat Treating, Sandblasting, and manufacturing
23	-	Building #23	1994	Clean Room	-
23	-	Building #23	1980s	Demolition c. 1988	-
24	-	Garage	c.1919	Construction	Garage
24	-	Garage	1952	-	-
24	-	Garage	1970s	Garage Demolished mid to late-1970s	-
24	-	Turbo Test Facility	1977	Construction	Turbo Compressor Testing
24	-	Turbo Test Building	1987	-	Turbo Compressor Testing
24	-	Test Building	1994	-	Pump Testing
25	-	Forging Department	c.1915	Added to eastern side of Bldg #8	Forge / smith shop
25	-	Blower Test and Assembly	1952	Possible oil-engine assembly	Manufacturing
25	-	Building #25	1987	-	Pump related
26	-	Empoyment Office	c.1919	Construction	Administrative
26	-	School	c.1933	additions also constructed	Administrative
26	-	Office Buildingg	1952	-	Administrative
26	-	Training Building	1987	-	Administrative
26	-	Training Building	1994	-	Administrative
27	-	Hospital/Dispensary	1917	-	Hospital/Dispensary
27	-	Dispensary	1952	Some additions	Hospital/Dispensary
27	-	Dispensary	1987	-	Hospital/Dispensary
27	-	Dispensary	1994	-	Hospital/Dispensary
28	-	Pump House	1918	Construction	Pump house
28	-	Pump House	1952	-	Pump house
28	-	Pump House	1987	-	Pump house
28	-	Pump House	1994	-	Pump house
29	-	Locomotive Shed	1919	Construction	Locomotive Shed
29	-	Locomotive House	1952	-	Locomotive Shed
29	-	Locomotive House	1987	-	Locomotive Shed
29	-	Locomotive House	1994	-	Locomotive Shed
30	-	Casting Cleaning	c.1925	-	Casting Cleaning
30	30A	Casting Cleaning	c.1925	addition of #30A between and connecting #4 and #30	Casting Cleaning
30	-	Casting Cleaning	1940s	Some additions	Casting Cleaning
30	-	Casting Cleaning/Foundry	1987	Vacant	-
30	-	Building #30	1988	Demolished	-
31	-	Building # 31	1933	-	Coal Box, Water Closet, Truck Scale
31	-	Memorial Hwy Gate House	1952	-	Guard Station
32	-	Compressor Storage	c.1919	Construction	Paint and Pipe Storage Shop
32	-	Compressor Storage	1952	-	-
32	-	Compressor Storage	1980s	Demolished	-
33	-	Brass Foundry	1924	-	Brass Foundry
33	-	Brass Foundry	c.1933	several small additions	Brass Foundry
33	-	Brass Foundry	c.1942	several small additions	Brass Foundry
33	-	Brass and Aluminum Foundry	1952	-	Brass and Aluminum Foundry
33	-	Brass and Aluminum Foundry	1987	-	Brass and Aluminum Foundry
33	-	Brass and Aluminum Foundry	1994	-	Brass and Aluminum Foundry
34	-	Compressor Manufacturing	c.1913	-	Compressor Manufacturing
34	-	Compressor Tool Room	1952	Some additions	Compressor Manufacturing
34	-	Tool Room / Office	1987	-	Turbo Compressor
34	-	Tool Room / Office	1994	-	Turbo Compressor

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BUILDING ID	Alt ID	Office	Date	NOTE	USE
35	-	South Garage	c.1925	-	Garage
35	-	South Garage	1952	-	Garage
35	-	South Garage	1960s	Demolished	Garage
35	-	Chlorinator Shed	1987	associated with Potable Well	Potable Well
35	-	Chlorinator Shed	1994	associated with Potable Well	Potable Well
36	-	North Garage	c.1919	Construction	Garage
36	-	North Garage	1952	-	-
36	-	North Garage	1962 - 1966	Demolished	-
36	-	Sandblast Facility	1978	Construction	Sandblast
36	-	Sandblast Facility	1987	-	Sandblast
36	-	Sandblast Facility	1994	-	Sandblast
37	22-A	Testing Shed	c.1922	N of #22, W of new scrap shed, and originally ID'd as 22-A	Testing Shed
37	-	Drill Engineering Test	1952	Demolished and re-built about 100 hundred feet to the N of the previous #37.	Drill Engineering Test
37	-	Drill Engineering Test	1975	Demolished	Drill Engineering Test
37	-	IRTO Truck Terminal	1978	Construction	Truck Garage
37	-	IRTO Truck Terminal	1987	-	Truck Garage
37	-	IRTO Truck Terminal	1994	-	Truck Garage
38	C	Construction Shed	c.1925	separate from #P	Construction Shed
38	38-A	Garage	c.1933	Addition connecting #C & #P?	Garage
38	-	Salvage Shed	1952	-	Storage
38	-	Building #38	1980s	Demolished	-
39	P	Stable	c.1920	-	Stable
39	-	Storage	c.1942	Drill division	Storage
39	-	Maintenance Storage	1952	Designation on FIA 1960 lables the whole #39, #40 and M complex as M	Storage
39	-	Building #39	1980s	Demolished	-
40	-	General Store	1917 or 1920s	-	Store (General Store)
40	-	Construction	c. 1945	-	Storage
40	-	Maintenance Storage	1952	Designation on FIA 1960 lables the whole #39, #40 and M complex as M	Storage
40	-	Building #40	1980s	Demolished	-
41	-	Mess Hall	1917 or 1920s	-	Mess Hall
41	-	Propane Tank	1970s	Construction	Propane storage
41	-	Propane Tank	1980s	Demolished	-
42	-	Bunk House	1917 or 1920s	Construction	Bunk House
42	-	Building #42	1952	Demolished	-
42	-	Main Substation	1940's	Constructed	Transformer yard
43	-	Washroom	1917 or 1920s	Construction	-
43	-	Building #41	1952	demolished	-
43	-	Bulk AST	1960	Construction	Oil Storage
43	-	Bulk AST	1987	49' dia Oil Storage Tank (#6 Oil)	Oil Storage
43	-	Bulk AST	1994	-	Oil Storage
44	-	Venturi Meter House	1952	W of Building # 36 ( Garage)	Meter House
45	-	Truck Scale House	1943	Construction	Truck Scale
45	-	Truck Scale House	1952	-	Truck Scale
45	-	Truck Scale House	1962	-	Truck Scale
45	-	Bulding #45	1966-1974	Demolished sometime between '66 and '72	Truck Scale
46	-	Auto Shed	1922	E of patter storage buildings I and K	Auto Shed
46	-	Auto Shed	1940	Demolished	Auto Shed
47	Annex #3	Building #47	1952	Demolished	-
47	-	Propane Facility	1970s	Construction	Propane storage
47	-	Propane Storage Tank	1987	Demo'd in 1980's	Propane storage
48	Annex #3	Building #48	1952	Demolished	-

**TABLE 1**  
**SUMMARY OF SITE BUILDINGS**  
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BUILDING ID	Alt ID	Office	Date	NOTE	USE
49	-	Hose House	1952	-	Part of the fire system
50	-	Acetylene Generator House	c.1925	Construction	Acetylene Generator House
50	-	Acetylene Generator House	1952	Demolished	Acetylene Generator House
51	-	Dust Collector	c.1925	Construction	Dust Collector
51	-	Dust Collector	1943	Demolished	-
51	-	Sand Conveyor House	1952	-	Sand Conveyor House
52	-	Reel House	c.1925	Incinerator present to W.	Reel House
52	-	Hose House	1952	-	Part of the fire system
53	PS-1	Bolt Storage Shed	c.1933	Construction	Bolt Storage Shed
53	-	Pipe Shed	1952	Possibly late 1940s - replaced with "Steel Storage Building" and Sandblast Bldg to W. Demolished	Pipe storage shed
53	-	Truck Shed	1970s	Construction	Truck Scale
53	-	New Truck Scale	1987	-	Truck Scale
53	-	New Truck Scale	1994	-	Truck Scale
54	-	Storage Shed	c. 1915	Construction	Storage Shed
54	-	Casting Shed	1944	Demolition	Casting Shed
54	-	Storage Bins	1952	compressor division	Storage bins
55	-	Cut-Off Bins	c.1942	Construction	Cut-Off Bins
55	-	Cut-Off Bins	1944	Demolition	-
55	-	Air Facilities Test Building	1953	Incinerator located to SW	Air Facilities Test Building
55	-	Steel Room	1997	Demolished and placed in LF	Storage
56	B	Storage Shed "B"	c. 1950	Constructed	storage
56	-	Storage Shed "B"	1952	Demolished	storage
56	-	Air Facility Building	1957	Incinerator located to SW and adjacent to lumber storage area.	Air Facilities Testing
56	-	Air Facility Building	1970s	Demolished	-
57	-	Acetylene Generator House	c.1915	Construction	Acetylene Generator House
57	-	Acetylene Generator House	1952	-	Acetylene Generator House
57	-	Acetylene Generator House	1980s	Demolition	Acetylene Generator House
58	-	Washroom	c.1922	Construction	Washroom
58	-	Washroom	c. 1933	demolished	storage
58	-	Storage Shed	c.1933	Construction NE of previous location East of #17	Tar Paper Storage
58	-	Storage Shed	1970s	-	Tar Paper Storage
58	N	Pattern Storage	btwn. 1913 & 1922	Construction	Pattern Storage
58	N	Pattern Storage	c.1925	Demolition and reconstruction S. of #4; ID'd as #N until 1970s	Pattern Storage
58	N	Pattern Storage	c.1933	S, near AST (demo'd in 1940's), Quarry shed and Trigger Shed appear	Pattern Storage
58	N	Pattern Storage	1970s	ID changed from #N to #58	Pattern Storage
58	N	Pattern Storage	1980s	Demolished	Pattern Storage
59	-	Scrap Bin	c.1905	-	Scrap Bin
59	-	Chip Bins	c.1925	not given ID until 1920s. Wash House to the E.	chip bin
59	-	Scrap Shed	1952	Demolished	Scrap bin
60	W	Oil Purifying Shed	c.1925	Construction Oil Purifying shed attached to Building #17	Testing Building
60	-	Testing Building	1930s	ID changes from #W to #60	Testing Building
60	-	Testing Building	c.1955	Demolition	-
60	-	Radiograph Building	1957	Construction	Radiograph Building
60	-	Radiograph Building	1987	-	-
60	-	Radiograph Building	1994	-	-
61	V	Pickling Shed	c.1915	construction, not given ID until 1930s	Pickling Shed
61	V	Pickling Shed	c.1933	N, 1905 Scrap shed demo'd	replaced with #83
61	-	Pickling Shed	1950s	Demolished	-
61	-	Wagon Drill Storage	1952	Construction	Wagon storage
61	-	Wagon Drill Storage	1970s	Demolition	Wagon storage
62	-	Drill Storage	1952	Construction	Drill Storage
62	-	Building #62	1980s	Demolished	Storage
63	-	Brass Chip Storage	c. 1922	Located along the E wall of #16	Brass Chip Storage
63	-	Brass Chip Storage	btwn. 1922 & 1933	Demolished	-
63	O	Construction	1925	Became known as #63 c. 1933	Store Shed
63	-	Forge Storage	1952	-	Storage
63	-	Maintenance Truck Garage	1987	-	Garage
63	-	Maintenance Truck Garage	1994	Remains on site	Garage

**TABLE 1**  
**SUMMARY OF SITE BUILDINGS**  
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BUILDING ID	Alt ID	Office	Date	NOTE	USE
64	-	Foundry Gate House	1933	Constructed	Foundry Gate House
64	-	Building #47	1952	Demolished and replaced with parking lot	Parking Lot
64	-	Bunk House	1950s	Construction	Railroad Bunk house
65	-	Water Closet	c.1933	assoc w/ #64 south of foundry	Water Closet
65	-	Waiting Shed	c. 1947	-	Waiting Shed
65	-	Building #65	1952	Demolished and replaced with parking lot	Parking Lot
65	-	Air Facilities	1966	Construction	Air Facilities
65	-	Building #65	1970s	Demolished	-
66	-	Guard House	1935	Construction Cameron	Guard House
66	-	Guard House	1950's	Demolished Cameron	Guard House
66	-	Gas Power Development	1966	Constructed	Development
66	-	Gas Power Development	c.1980	Demolished	Development
66	-	Test Development Lab	1980	Located along the E wall of #24	Turbo Testing
66	-	Test Development Lab	1987	Located along the E wall of #24	Turbo Testing
66	-	Turbo Storage Shed	1994	Located along the E wall of #24	Turbo storage
67	R	Locomotive Crane	c.1913	Construction	Loading area for Railcars
67	-	Storage Shed	1952	Up to 1952 the Locomotive Crane operated	Storage
67	-	Storage Shed	1970s	Demolition	Storage
68	-	Cutting Oil Manufacturing Building	c.1919	Constructed just E of # 23	Oil-Mixing House
68	-	Building #68	1952	Demolished	Storage
69	-	Railroad Scale	c. 1935	Construction	Railroad Scale
70	-	Pump House	1952	Never used	Pump
71	T	Winch Room	c.1913	Construction	Winch Room for the mine
71	T	Mine Hoist	1952	-	Mine hoist for mine
71	T	Mine Hoist	1970s	Demolition (unvarified)	-
72	-	Mine Shaft House	-	-	Mine Shaft House
72	-	Mine Shaft House	1952	-	Mine Shaft House
72	-	Demolished	1970s	Demolition (unvarified)	-
73	-	Gate House	1952	-	-
73	F	Lumber Storage	c.1925	-	Lumber Storage
73	F	Lumber Storage	1970s	Renamed from #F to #73	Lumber Storage
73	F	Lumber Storage	1980s	Demolished	Lumber Storage
74	-	Dust Arrestor Shed	1952	Demolished unknown Construction	Dust Collector
74	G	Flask/Obsolete Pattern Storage	c.1913	Construction	Flask/Obsolete Pattern Storage
74	G	Flask/Obsolete Pattern	c.1925	1-9K gal UST installed adjacent; btwn. # I & #G	Flask/Obsolete Pattern Storage
74	G	Flask/Obsolete Pattern Storage	1970s	Renamed from #G to #74	Flask/Obsolete Pattern Storage
74	G	Flask/Obsolete Pattern Storage	1980s	Demolished	Flask/Obsolete Pattern Storage
75	-	Sand Blast House	1952	Demolished unknown Construction	Sand Blast
75	H	Flask/Obsolete Pattern	c.1913	Constructed	Flask/Obsolete Pattern Storage
75	H	Flask/Obsolete Pattern	c.1955	Oxygen tank installed to W	Flask/Obsolete Pattern Storage
75	H	Flask/Obsolete Pattern	1970s	Renamed from #H to #75	Flask/Obsolete Pattern Storage
75	-	Flask/Obsolete Pattern	1980s	Demolished	Flask/Obsolete Pattern Storage
76	-	Hose House	1952	Demolished unknown Construction	Hose house
76	I	Construction	c.1913	Flask/Obsolete Pattern Storage - ID'd as #I until 1970s	-
76	I	Flask/Obsolete Pattern	c.1925	1-9K gal UST installed adjacent; bet. # I & #G	Flask/Obsolete Pattern
76	I	Flask/Obsolete Pattern	1970s	Renamed from #I to #76	Flask/Obsolete Pattern
76	I	Flask/Obsolete Pattern	1980s	Demolished	Flask/Obsolete Pattern
77	Stge Bins	Concrete storage bins	c.1905	Construction	Coal, sand, and clay storage
77	-	Foundry Sand Bins	1952	-	foundry sand storage
77	-	Foundry Sand Bins	1980	Demolished	-

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BUILDING ID	Alt ID	Office	Date	NOTE	USE
78	Reservoir	Reservoir / Condenser Pond	c.1905	Construction	Non-contact cooling water
78	-	Reservoir (spray pond)	1934	Installation of WW-2 @ NW corner	Non-contact cooling water
78	-	Reservoir (spray pond)	1939	N. Inverse Ponds and several possible sinkholes to E.	Non-contact cooling water
78	-	Reservoir (spray pond)	1952	-	Non-contact cooling water
78	-	Spray Pond	1970s	Reconfiguration - new spray trees	Non-contact cooling water
78	-	Spray Pond	1987	-	Non-contact cooling water
78	-	Spray Pond	1994	Remains on site	Non-contact cooling water
79	-	Bulk AST	c.1915	initially ID's as #19	Oil Storage
79	86	Bulk AST	1970s	Unclear if original #79 was demolished and replaced with or renamed #86.	Water Tank
79	-	Oil Tank	1970s	Construction NW of previous location	Oil Storage
80	-	Gas Tank	1920s	Construction	Natural Gas Storage
80	-	Bulk AST	1930s	Quarry Shed and Trigger Shed adjacent to N.	Storage
80	-	Bulk AST	est. 1947	File index indicates a 1952 demolition.	-
80	-	Building #80	1957	New Building	File Storage
80	-	File Storage	1970s	Demolished	-
81	-	Mine Hoist	1926	Construction by lat 1920s ID's as Sharpener	Mine hoist for mine
81	-	Student's Blacksmith Shop	1952	-	blacksmith shop
81	-	Training Building	1970s	Demolished	Training
82	-	Commercial Drill Test	c.1933	Construction	Commercial Drill Test
82	-	Commercial Drill Test Bldg	1952	-	Drill test
82	-	Commercial Drill Test Bldg	1980s	Demolition	Drill test
83	-	Casting Staging and Oil House	c.1933	Replaced Scrap Bin. 1-10K gal cutting oil UST to N.	Casting Staging and Oil House
83	-	Drill Storage and Oil House	1952	Records indicate change in use	Drill Storage and Oil House
83	-	Drill Storage and Oil House	1980s	Demolition	-
84	-	Lumber Shed	c.1925	Construction	Lumber Storage
84	-	Lumber Shed	1952	-	Lumber Storage
84	-	Lumber Shed	1974-1981	Demolished	Lumber storage
85	-	Crane	c. 1942	Construction	crane
85	-	Winch House Stone Derrick	1952	-	crane
85	K	Obsolete Pattern Storage	c.1925	ID'd as #K until 1970s	Obsolete Pattern Storage
85	K	Pattern Storage	1970s	Renamed from #K to #85	Pattern Storage
85	K	Pattern Storage	1980s	Demolished	Pattern Storage
86	-	Water Tower	c.1905	Construction likely after well installation in 1903	-
86	-	Water Tower	1970s	Demolition	-
86	79	Water Tank	1987	Possibly same tank as former #79	Water Tank
86	-	Water Tank	1994	Remains on site	Water Tank
87	-	Gun Club	c. 1910	Construction	Gun Club
87	-	Gun Club	c.1919	Changed to "Seed House"	Seed House
87	-	Seed House	1952	Changed to "Garden House" - incinerator present to W	Garden House
87	-	Building #81	late-70s	Based on aerial photos '74 and '81	-
87	L	Lumber Shed	c.1913	ID's as #L until 1970s	Lumber Shed
87	L	Lumber shed	1970s	Renamed from #L to #87	Lumber Shed
87	L	Lumber shed	1980s	Demolished	Lumber Shed
88	-	Coal Storage Trestle	c.1915	Construction	Coal Storage
88	-	Coal Storage Trestle	c.1939	-	Coal Storage
88	-	Coal Storage Trestle	1952	-	Coal Storage
88	-	Coal Storage Trestle	1970s	Demolished	Coal Storage
89	-	Truck Garage	c.1942	Constructed	Truck Garage
89	-	Truck Garage	1952	-	-
89	-	Building #89	1970s	-	-
89	J	Obsolete Pattern Storage	c.1925	ID's as #J until 1970s	Obsolete Pattern Storage
89	J	Obsolete Pattern Storage	1970s	Renamed from #J to #89	Obsolete Pattern Storage
89	J	Pattern Storage	1980s	Demolished	Obsolete Pattern Storage

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BUILDING ID	Alt ID	Office	Date	NOTE	USE
90	-	Drill Stroage	c.1942	Construction	Drill Storage
90	-	Drill Storage Building	1952	-	Drill Storage
90	-	Drill Storage Building	1980s	Demolished	Drill Storage
91	-	Babbitt Building	c.1945	Construction	Babbitt Building
91	-	Babbitt Building	1952	-	Babbitt Building
91	-	Storage	1997	Demolished and placed in LF	Storage
92	-	Guard House (Gate #20)	1952	Construction	Guard House
93	-	Guard House (Gate #21)	1952	-	-
94	-	Guard House (Gate #22)	1952	-	-
95	-	Guard House (Gate #23)	1952	-	-
96	-	Guard House (Gate #24)	1952	-	-
97	-	Guard House (Gate #25)	1952	-	-
98	-	Guard House	c.1920	Concruction	-
98	-	Guard House	c.1945	Demolished	-
99	-	Bus Terminal	c.1942	Construction	Bus Stop
99	-	Bus Terminal	1952	-	Bus Stop
99	-	Building #99	1970s	#99 reused on unknown structure at NE corner of site	-
100	-	Bulk AST	c.1942	Construction	Oil Storage
100	-	Bulk AST	1952	210,000-gal Oil Storage Tank	Oil Storage
100	-	Oil Storage Tank	1987	-	Oil Storage
100	-	Oil Storage Tank	1994	-	Oil Storage
100	-	Oil Storage Tank	2001	Tank is out of service	Oil Storage
101	-	Foundry Office	1976	Construction	Office
101	-	Construction	1976	-	Office
101	-	Sales Office Building	1987	-	Office
101	-	Sales Office Building	1994	Remains on site	Office space
102	-	Receiving Platform / Office	1940	Construction	-
102	-	Receiving Platform	1974 and 1981	Demolished	-
103	-	Compressor Storage	c.1945	Construction	Storage
103	-	Storage Building	1960	-	55-gal drum of kerosene
103	-	Turbo Storage	1970s	Demolished	Storage
104	-	Oil Tanks (3x10,000-gal)	c. 1940s	first ID's as #104 c. 1940	3-10K gal Oil "Day storage" Tanks
104	-	Oil Tanks (3x10,000-gal)	1952	-	-
104	-	Oil Storage Tanks	1987	Enclosed in structure #104 and above-ground piping installed from ASTs to main buildings	Changed from oil storage to oil-water separation c.1986
104	-	Oil-Water Separator Tanks	1994	remain on-site	oil-water separator for GW remediation
105	-	Shot Blast Cleaning Shed	c.1945	Construction, file index indicates a 1951 construction	Shot Blast Cleaning Shed
105	-	Sand Blast	1952	-	Sand Blast
105	-	Shot Blast	1997	Demolished and placed in LF	Sand Blast
106	-	Pattern Storage	c.1966	Construction	Pattern Storage
106	-	Pattern Storage	1987	-	-
106	-	Pattern Storage	1994	-	-
107	-	Storage Building	1970s	Constructed	Storage
107	-	Pattern Storage	1980s	remain on-site	Storage
110	-	Pump House	1974	Construction	Water pump House
110	-	Pump House	1987	-	Water pump House
110	-	Pump House	1994	-	Water pump House
111	-	Gas Compressor House	1975	Construction	-
111	-	Gas Compressor House	1992	No longer in use, structure remains	-
111	-	Air Stripper	1992	Construction, remains on-site and in use	Air stripper for drinking water
251A	-	Construction	c.1913	Engine Room	Engines and Generators
251B	-	Construction	c.1913	Boiler House	5 horizontal boilers
251	-	Maintenance Shop	1940s	Presume A & B combined; File index indicates 1939 construction	Maintenance Shop
251	-	Building #251	1952	-	Steel Fabrication, Maintenance Shop, and Electrical Substation
251	-	Repair/DC Rectifier	1987	-	-
251	-	Repair/DC Rectifier	c. 1990	Demolition	-

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BUILDING ID	Alt ID	Office	Date	NOTE	USE
252	-	Main Building	1912	Construction	Manufacturing of Cameron Pump
252	-	Main Building	c.1925	internal renovation	added a carpenter shop, brass and iron casting
252	-	Machine Shop	1952	Additions in 1940s; Craneway added in 1950s	added a hydor-test area and storage area
252	-	Machine Shop	1987	-	-
252	-	Machine Shop	early-90s	Demolished	-
253	-	Garage	1912	Construction	Garage
253	-	Garage	c.1945	Demolished	Garage
253	-	Small Pump Manufacturing	1952	Constructed	pump manufacturing
253	-	Building #253	1987	-	storage, paint spraying and office
253	-	Building #253	early-90s	Demolished	-
254	-	Building #254	c.1940	determine est. const. date	Pickling Sed
254	261	# 254 eliminated in 1941, now part of #261	1952	-	-
254	-	Building #254	1964	Construction	Storage
254	-	Storage	1987	-	Storage
254	-	Building #254	early-90s	Demolished	Storage
255	-	Building #255	1930s	Construction	Cut off building
255	-	Building #255	1941	demolished	Cut off building
255	-	Building #255	1963	Construction	Steel Bar Storage
255	-	Building #255	1987	-	Steel Bar Storage
255	-	Building #255	early-90s	Demolished	-
256	-	Building #256	1930s	Constructed	Cut off and Storage
256	-	Building #256	1941	Demolished	-
257	-	Building #257	c.1933	Constructed, file index indicated 1912 construction	Painting, erecting, and shipping building
257	-	Building #257	1952	Additions in 1940s & 50s	Painting, erecting, and shipping building
257	-	Building #257	1970s	Addition	Painting, erecting, and shipping building
257	-	Building #257	1987	-	Assembly/Shipping
257	-	Building #257	early-90s	Demolished	-
258	-	Building #258	c.1933	Constructed, file index indicated 1912 construction	Pump Test Pit
258	-	Building #258	1952	Additions in 1940s & 50s	Test Pit, pump assembly
258	-	Building #258	c.1966	Addition connecting #259	Test Pit
258	-	Building #258	1970s	Addition	Test Pit
258	-	Building #258	1987	-	Test Pit
258	-	Building #258	early-90s	Demolished	-
259	-	Office	c. 1933	Construction, file index indicated 1929 construction	Office Building
259	-	Office	1952	-	Office Building
259	-	Office	c.1966	Addition #259A connecting #258	Office Building
259	259/259A	Office	1987	-	Vacant
259	259/259A	Office	late-80s	Demolition	Vacant
260	-	Garage	c. 1933	Construction	Garage
260	-	Garage	1952	-	Garage
260	-	Garage	btwn 1966 - 1974	Demolition	-
261	-	Building #261	c.1933	File index indicated 1920 construction.	Storage, Heat Treating, Casting & Cleaning
261	-	Building #261	1952	Additions in 1940s	Brass Casting Shed, Saw Shed, and Bar Steel Storage Shed
261	-	Building #261	1987	Demolition c. late 80s early 90s	-
262	-	Building #262	c.1940	Additions in 1950s	Brass Casting Shed
262	-	Building #262	Early-40s	became part of Building #261	Brass Casting Shed
262	-	Building #262	1953	-	Office space, paint vault, pump part storage
262	-	Building #262	1987	-	-
262	-	Building #262	early-90s	Demolished	-
263	-	Gas Meter House	c.1933	File index indicated 1943 construction. Neptune meter located to N.	Gas Meter
263	-	Gas Meter House	1952	Possibly relocated in 1950s	Gas Meter
263	-	Gas Meter House	1987	-	Gas Meter
263	-	Gsa Meter House	early-90s	-	Gas Meter



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264	-	Paint/Oil Storage	1977	Construction	Paint/Oil Storage
264	-	Paint/Oil Storage	1987	-	Paint/Oil Storage
264	-	Paint/Oil Storage	early-90s	Demolished	Paint/Oil Storage
A	-	Reel House	c.1925	Construction Reel House SW of #J	Reel House
	-	Reel House		Demolition data unknown	-
E	-	Flask Storage	c.1913	Construction	Flask Storage
E	-	Flask Storage	c.1939	Demolished	Flask Storage
M	-	Drill Machine Storage	c.1915	Construction	Machinery Storage
M	-	Drill Machine Storage	c.1925	Store Shed	Machine Storage
M	-	Drill Machine Storage	c.1933	additions	Machine Storage
M	-	Drill Machine Storage	1980s	Demolished	-
U	-	Forge Shop	c.1913	Construction	Forge Shop
U	-	Forge Shop	c.1925	replaced with Mine Hoist #81	Forge Shop
PS-1	#53	Shed	c.1922	Shed	Bolt Storage
PS-1	#53	Shed	c.1929	Became building #53	Bolt Storage
PS-2	-	Shed	c.1922	Shed	Storage
PS-2	-	Shed	c.1929	demo'd during extension to #9	Storage
PS-3	-	Shed	c.1922	Pipe Storage	Pipe storage
PS-3	-	Shed	c.1929	demo'd during extension to #9	Pipe storage

**TABLE 2**  
**SUMMARY AND STATUS OF PREVIOUSLY IDENTIFIED AREAS OF CONCERN**  
**Site History Report - October 2004**  
Former Ingersoll-Rand Facility  
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AOC	DESCRIPTION	CONTAMINANTS OF CONCERN	NFA STATUS	REFERENCE	PROPOSED ACTIVITIES	SCHEDULE
AOC- 1	Transformer (removed) East End Bldg. #12	TPHC and PCB	---	SI Sampling of TPHC and PCB reported in October 23, 1997 AOC-1 Field Sampling Summary Report.	Delineation Sampling (Completed) and Deed Notice.	Investigation - 11/2003 Deed Notice - 3/2005
AOC-2	Spray Pond Sludge Disposal Area	TPHC and PCB	---	Waste classification sampling plan submitted to NJDEP on July 11, 2003.	Waste Classification Sampling (Completed), Excavation and offsite disposal, post-excavation sampling.	RI Sampling - 11/2003 Excavation - 3/2005 PE Sampling - 4/2005
AOC-3a	Former Chip Storage Area - Cameron East End Bldg. 252	No Exceedances of Applicable Criteria	NFA Granted	NJDEP May 14, 2002 letter.	No further action proposed in May 2000 SI/RI Report, February 2001 RI Addendum, May 2001 SI/RI Report, and January 2002 RI Report.	N/A
AOC-3b	Former Chip Storage Area - Cameron South Side Bldg. 252	No Exceedances of Applicable Criteria	NFA Granted	NJDEP May 14, 2002 letter.	No further action proposed in May 2000 SI/RI Report, February 2001 RI Addendum, May 2001 SI/RI Report, and January 2002 RI Report.	N/A
AOC-3c	Former Chip Storage Area- West of Bldg. 91	PAHs, PCBs, Arsenic, Copper, and Lead	---	SI Completed, Delineation soil sampling required.	Delineation Sampling (Completed) and Deed Notice.	Investigation - 11/2003 Deed Notice - 3/2005
AOC-3d	Former Chip Storage Area- South of Bldg. 55	PAHs, PCBs, Arsenic, Copper, and Lead	---	SI Completed, Delineation soil sampling required.	Delineation Sampling (Completed) and Deed Notice.	Investigation - 11/2003 Deed Notice - 3/2005
AOC-3e	Former Chip Storage Area- West Bldg. 17b	No Sampling conducted	---	NJDEP October 18, 1994 letter.	Investigate (Completed) and deed notice as may be necessary.	Investigation - 11/2003 Deed Notice (if nec.) - 3/2005
AOC-3f	Former Chip Storage Area- North of Bldg. 17a	PCB and Arsenic	---	SI Completed, Delineation soil sampling required.	Investigate (Completed) as proposed in 1994 RIWP, Deed Notice	Investigation - 11/2003 Deed Notice - 3/2005
AOC-4	Three Round Concrete Tanks - North of Bldg. 17a	No Exceedances of Applicable Criteria	NFA Granted	NJDEP January 23, 1997 letter.	No further action proposed in October 1996 UST Closure Report.	N/A
AOC-5	Contaminated Soil Piles- East of Bldg. 17b.	No Sampling conducted	---	Reduced sampling scope requested in July 11, 2003 letter to NJDEP.	Conduct Sampling (Completed), Reuse soil onsite.	Investigation - 11/2003 Soil Reuse Plan - 3/2005 SRP Implementation - 9/2005
AOC-6	Cameron Coolant Disposal Area	No Sampling has been conducted to date (AOC was not located)	NFA Conditionally Granted	NJDEP October 18, 1994 letter.	No further action proposed in 1994 Draft RIWP.	N/A
AOC-7	Three UST's (Fuel Oil) - Bldg. 13 (Abandon In-place)	No Exceedances of Applicable Criteria	NFA Granted	NJDEP January 23, 1997 letter.	No further action proposed in October 1996 UST Closure Report.	N/A
AOC-8	500 Gallon Gasoline Tank - NW Corner Bldg. 263 (removed)	No Exceedances of Applicable Criteria	NFA Granted	NJDEP January 23, 1997 letter.	No further action proposed in October 1996 UST Closure Report.	N/A
AOC-9	10,000 Gallon UST (Diesel Oil) - East of Bldg. 12 (Abandon In-place - 1983)	No Exceedances of Applicable Criteria	NFA Granted	NJDEP January 23, 1997 letter.	No further action proposed in October 1996 UST Closure Report.	N/A
AOC-10	Bldg. 14- (Former Heat Treat Bldg.)	PCE , TCE, Arsenic, Beryllium, Lead, and Thallium	NFA Conditionally Granted	NJDEP August 2, 2000 letter.	No further action proposed in February 2000 Remedial Investigation Report. NFA requires incorporation into Deed Notice.	Deed Notice - 3/2005
AOC-11	One 10,000 Gallon UST - (Methanol) South of Bldg. 14 (demolished)	No Exceedances of Applicable Criteria	NFA Granted	NJDEP August 2, 2000 letter.	No further action proposed in February 2000 Remedial Investigation Report.	N/A
AOC-12	Two 10,000 Gallon UST's (Quenching Oil) South of Bldg. 14 (demolished)	TPHC, PAHs, and Beryllium	---	February 2000 Remedial Investigation Report	Additional soil investigation including soil delineation (Completed) and possible LNAPL recovery,	Investigation - 11/2003 RAW - 9/2005
AOC-13	One 500 Gallon UST (Gasoline) South of Bldg. 14 (assumed removed could not locate)	N/A - Tank never located, assumed to have been removed.	NFA Granted	NJDEP January 23, 1997 letter.	No further action proposed in October 1996 UST Closure Report.	N/A
AOC-14	One 500 Gallon UST (Benzene) North of Bldg. 14 (assumed removed- could not locate)	No Exceedances of Applicable Criteria	NFA Granted	NJDEP January 23, 1997 letter.	No further action proposed in October 1996 UST Closure Report.	N/A
AOC-15	Two 1000 Gallon UST's (Diesel & Lube Oil) - North of Bldg. 8	No Exceedances of Applicable Criteria	NFA Granted	NJDEP January 23, 1997 letter.	No further action proposed in October 1996 UST Closure Report.	N/A
AOC-16	Bldg. 17 - Former Drill Manufacturing Bldg.	No Sampling has been conducted to date	---	June 1994 Draft Remedial Investigation Workplan	Sample grid and delineate as necessary (Completed), Incorporate into Deed Notice if warranted.	Investigation - 11/2003
AOC-17	Former location of Iron Foundry	TPHC, PAHs, and Beryllium	---	May 2001 SI/RI Report	Delineation soil sampling (Completed), Incorporate into Deed Notice.	Investigation - 11/2003 Deed Notice - 3/2005

**TABLE 2**  
**SUMMARY AND STATUS OF PREVIOUSLY IDENTIFIED AREAS OF CONCERN**  
**Site History Report - October 2004**  
Former Ingersoll-Rand Facility  
Phillipsburg, New Jersey

AOC	DESCRIPTION	CONTAMINANTS OF CONCERN	NFA STATUS	REFERENCE	PROPOSED ACTIVITIES	SCHEDULE
AOC-18	Monitoring Wells 5,24, & 26 Area	LNAPL	---	February 2002 Groundwater Remedial Investigation Workplan	Free Product Recovery and continued monitoring. Possible Classification Exception Area for groundwater beneath site.	GW Monitoring occurs semiannually, RAW expected in 2006 to include a CEA.
AOC-19	1500 Gallon Waste Oil Tank- Bldg. 12 Air Trappage Tank	TPHC, PCE, PAHs, Arsenic, and Copper	---	June 1994 Draft Remedial Investigation Workplan.	Review existing data conduct sampling (Completed), include in Deed Notice	Investigation - 11/2003 Deed Notice - 3/2005
AOC-20	5000 Gallon Waste Oil Tank in Bldg. 12	No sampling required under ISRA	NFA Granted	NJDEP October 18, 1994 letter.	No further action proposed in June 1994 Draft Remedial Investigation Workplan.	N/A
AOC-21	1750 Gallon AST Waste Coolant Tank South of Bldg. 9	No sampling required under ISRA	NFA Granted	NJDEP October 18, 1994 letter.	No further action proposed in June 1994 Draft Remedial Investigation Workplan.	N/A
AOC-22	600 Gallon AST - Brill Skimmer	No sampling required under ISRA	NFA Granted	NJDEP March 28, 1995 letter.	No further action proposed in June 1994 Draft Remedial Investigation Workplan.	N/A
AOC-23	Incinerator Site (1976-74) South End of Spray Pond	PAHs, Copper, and Nickel	---	ENSR September 2002 AOC-23, 33, & 34 Site Investigation Report; NJDEP December 19, 2002 Letter.	Conduct RI sampling (Completed), Deed Notice	Investigation - 11/2003 Deed Notice - 3/2005
AOC-24	One 2000 Gallon Process Tank - Bldg. 12	No sampling required under ISRA	NFA Granted	NJDEP October 18, 1994 letter.	No further action proposed in June 1994 Draft Remedial Investigation Workplan.	N/A
AOC-25	Two 10,000 Gallon UST's - Southwest Bldg. 17 (certified & removed)	No sampling required under ISRA	NFA Granted	NJDEP October 18, 1994 letter.	No further action proposed in June 1994 Draft Remedial Investigation Workplan.	N/A
AOC-26	One 2000 Gallon UST - South Bldg. 254 (certified & removed)	No Current Exceedances of Applicable Criteria	NFA Granted	NJDEP October 18, 1994 and May 14, 2002 letters.	No further action proposed in June 1994 Draft Remedial Investigation Workplan.	N/A
AOC-27	Hazardous Waste Storage Shed - East Bldg. 12	No sampling required under ISRA	NFA Granted	NJDEP October 18, 1994 letter.	No further action proposed in June 1994 Draft Remedial Investigation Workplan.	N/A
AOC-28	Ultrafilter in Bldg. 12	No sampling required under ISRA	NFA Granted	NJDEP October 18, 1994 letter.	No further action proposed in June 1994 Draft Remedial Investigation Workplan.	N/A
AOC-29	Old Landfill	TPHC, PAHs, PCBs, Antimony, Arsenic, Beryllium, Cadmium, Copper, Lead, Nickel, and Zinc	NFA Conditionally Granted	ENSR May 2001 AOC-3a, 3b, 26, 29, 31, & 37 Site/Remedial Investigation Report; NJDEP March 6, 2002 letter; NJDEP September 10, 2002 letter.	Prepare RAW and Draft Deed Notice, Cover.	RAW and Draft DN - 3/2005 Cover - 2006
AOC-30	Sludge in bottom of Spray Pond	TPHC, PAHs, PCBs, Arsenic, Copper, Lead, Mercury, Nickel, and Zinc	requested	IDP Letter to NJDEP dated December 20, 1999; April 1996 Field Sampling Summary Report AOC-30.	Sludge removal as part of routine maintenance	N/A
AOC-31	Two Lined Inverse Ponds	TPHC, PAHs, Arsenic, Beryllium, Copper, Lead, Mercury, Nickel, and Zinc	---	2002 AOC-31 Inverse Ponds Site/ Remedial Investigation Report; May 2001 Site/Remedial Investigation Report for AOCs 3a, 3b, 26, 29, 31, & 37.	Evaluate pond closure and removal options and conduct remedial investigation activities. Excavate and dispose, and/or deed notice.	Close ponds - 6/2006 Investigation - 9/2006 RAW - 6/2007 RA/DN - 2008
AOC-32	Two Unlined Lagoons	No Sampling has been conducted to date	NFA Granted	NJDEP March 28, 1995 letter.	No further action proposed in June 1994 Draft Remedial Investigation Workplan.	N/A
AOC-33	Incinerator - North of Bldg. 17b	TPHC and Arsenic	---	ENSR September 2002 AOC-23, 33, & 34 Site Investigation Report; NJDEP December 19, 2002 Letter.	RI Activities (Completed), Deed Notice	Investigation - 11/2003 Deed Notice - 3/2005
AOC-34	Incinerator - West Corner of Bldg. 22	PAHs	---	ENSR September 2002 AOC-23, 33, & 34 Site Investigation Report; NJDEP December 19, 2002 Letter.	RI Activities (Completed), Deed Notice	Investigation - 11/2003 Deed Notice - 3/2005
AOC-35	1000 Gallon UST (Diesel Oil) Tank - East of Bldg. 12 (removed)	No Current Exceedances of Applicable Criteria	NFA Granted	NJDEP April 11, 2000 Letter.	No further action proposed in August 1995 RI/RA Report and July 13 1998 letter to NJDEP.	N/A
AOC-36	Contaminated Soil Piles - South of Bldg. 111 - Stockpiled in early 1990s during excavation for site modification	No Sampling Conducted To Date	---	Reduced sampling scope requested in July 11, 2003 letter to NJDEP,	Conduct Sampling (Completed), Soil Reuse onsite	Investigation - 11/2003 Soil Reuse Plan - 3/2005 SRP Implementation - 9/2005
AOC-37	Ephemeral Stream	Arsenic	NFA Granted	NJDEP May 14, 2002 Letter.	No Further Action - Deed Notice proposed in the May 2001 Site/Remedial Investigation Report for AOCs 3a, 3b, 26, 29, 31, & 37.	Deed Notice - 3/2005
AOC- 38	Buried No. 2 & 6 Fuel Oil Pipelines	TPHC	NFA Granted	NJDEP April 11, 2000 Letter.	No Further Action proposed in the July 1995 Status of the Remedial Investigation/Remedial Action on the Buried No. 2 and No. 6 Fuel Oil Lines and the August 1995 Report of Soil Investigation at AOC-28 and AOC-35.	N/A
AOC- 39	Scrap Pad - South Bldg. 24	TPHC and PAHs	---	IDP Letter to NJDEP dated October 27, 1997	Conduct RI sampling (Completed), Deed Notice	Investigation - 11/2003 Deed Notice - 3/2005

**TABLE 2**  
**SUMMARY AND STATUS OF PREVIOUSLY IDENTIFIED AREAS OF CONCERN**  
**Site History Report - October 2004**  
Former Ingersoll-Rand Facility  
Phillipsburg, New Jersey

AOC	DESCRIPTION	CONTAMINANTS OF CONCERN	NFA STATUS	REFERENCE	PROPOSED ACTIVITIES	SCHEDULE
AOC- 40	Concrete Structure near former Rock Drill Bldg.	No Current Exceedances of Applicable Criteria	requested	IDP's October 1999 letter to NJDEP.	No Further Action Proposed in the October 1999 Progress Report.	N/A
AOC-41	Spill at Separator Building	TPHC	---	June 2000 Progress Report and Report of Spill at Separator Bldg.	Conduct RI sampling (Completed), Deed Notice or excavate.	Investigation - 11/2003 Deed Notice or RAW - 3/2005
AOC-42	Groundwater - West Side of Fuel Oil Plume	Select Chlorinated Volatile Organic Compounds	---	Ongoing monitoring per February 2002 Groundwater Remedial Investigation Workplan.	Continue Monitoring as required. Possible Classification Exception Area for groundwater beneath site.	Sampling conducted semiannually. RAW expected in 2006 to include a CEA.
AOC-43	Groundwater - LNAPL Plume	LNAPL	---	Ongoing remediation and monitoring per February 2002 Groundwater Remedial Investigation Workplan.	Continued Product Recovery and monitoring with development of Remedial Action Workplan and Classification Exception Area proposal.	LNAPL Recovery ongoing with continuing modifications to on site recovery system. RAW scheduled for 2006 to include a CEA.
AOC-44	Groundwater - Dissolved Phase	Select Chlorinated Volatile Organic Compounds and Metals	---	Ongoing monitoring per February 2002 Groundwater Remedial Investigation Workplan.	Continued monitoring and delineation activities with development of Remedial Action Workplan and Classification Exception Area proposal.	Sampling conducted semiannually. RAW expected in 2006 to include a CEA.
AOC-45	Pits in Building #16	2003/2004 sampling indicated chlorinated organics and metals.	---	Identified in internal memorandum Re: Regulatory Applicability of potential tenant Blue Ridge Steel	Collect SI Samples per Tech Regs (Completed). - Based on results, a well was also installed.	Investigation - 11/2003 Deed Notice - 3/2005

Updated May 28, 2004

**NOTES:**

AOC = Area of Concern  
CEA = Classification Exception Area  
DN = Deed Notice  
GW = Groundwater  
IDP = Ingersoll Dresser Pump Co.  
ISRA = Industrial Site Recovery Act  
LNAPL = Lighter than water Non-Aqueous Phase Liquid  
N/A = Not Applicable  
NFA = No Further Action  
NJDEP = New Jersey Department of Environmental Protection  
PAH = Polycyclic Aromatic Hydrocarbons

PCB = Polychlorinated Biphenyls  
PCE = Tetrachloroethylene  
PE = Post Excavation  
RAW = Remedial Action Workplan  
RI = Remedial Investigation  
RIWP = Remedial Investigation Workplan  
SI = Site Investigation  
SRP = Soil Reuse Plan  
TCE = Trichloroethylene  
TPHC = Total Petroleum Hydrocarbons

**TABLE 3**  
**SUMMARY OF NEWLY IDENTIFIED AREAS OF CONCERN**  
**Site History Report - October 2004**  
Former Ingersoll-Rand Facility  
Phillipsburg, New Jersey

AOC	DESCRIPTION	CONTAMINANTS OF CONCERN <sup>(1)</sup>	NFA STATUS	REFERENCE	PROPOSED ACTIVITIES	SCHEDULE
AOC-46	Coal Trestle / Former Coal Storage Area(s)	PAH/BN, Metals	---	Forthcoming Report	Sample and incorporate into Deed Notice	SI sampling - 6/04
AOC-47	Locations of Former X-Ray Machines	Radionuclides	---	Forthcoming Report	Conduct Rad survey	Rad Survey - 6/04
AOC-48	Former Mine	---	---	Forthcoming Report	Discuss investigation strategy with NJDEP	to be determined
AOC-49	Transformers - Historic and Current	TPHC, PCB	---	Forthcoming Report	Assess locations of these operations in relation to previously conducted sampling	to be determined
AOC-50	Dry Wells, Cesspools, Pits, & Leach Fields	---	---	Forthcoming Report	Sample to verify clean closure	to be determined
AOC-51	Onsite Ponds (current and historic)	---	---	Forthcoming Report	Sample to verify clean closure	to be determined
AOC-52	Building sumps, pits, floor drains	---	---	Forthcoming Report	Determine construction type	to be determined
AOC-53	Subsurface Utilities	---	---	Forthcoming Report	Assess locations of these operations in relation to previously conducted sampling	to be determined
AOC-54	ASTs/USTs (including bulk storage tank farm ) not previously investigated	---	---	Forthcoming Report	Sample to verify clean closure	to be determined
AOC-55	Rail lines	---	---	Forthcoming Report	Map locations based on historic information and incorporate into Deed Notice.	to be determined
AOC-56	Plating Operations	---	---	Forthcoming Report	Assess location of these operations in relation to previously conducted sampling	to be determined
AOC-57	Boilers, ovens, furnaces, and Incinerators	---	---	Forthcoming Report	Assess location of these operations in relation to previously conducted sampling	to be determined
AOC-58	Fill	PAH, Metals	---	Forthcoming Report	Map locations based on historic information and incorporate into Deed Notice.	to be determined
AOC-59	Roof/Process Vents and Roof Drains	---	---	Forthcoming Report	Assess location of these operations in relation to previously conducted sampling	to be determined
AOC-60	Scrap Pads, Storage Areas, and Process Areas	---	---	Forthcoming Report	Assess location of these operations in relation to previously conducted sampling	to be determined

**NOTES:**

The potential AOCs listed above have been identified based on the historic review currently in progress. Specific locations of identified areas will be provided as the historic review progresses.

(1) All indicated COCs are presumed based on anticipated sampling parameters or previously known impacts of similar AOCs.

**TABLE 4**  
**Summary of Transformers and Oil-Filled Equipment**  
**Site History Report - October 2004**  
Former Ingersoll-Rand Facility  
Phillipsburg, New Jersey

**Transformers**

Substation	Location	Description	S/N	Gallons Oil	Sampled?	Result (ppm)
1	NE Corner of 7 & 8	East transformer	H887854A	158	YES	61
1	NE Corner of 7 & 8	Disconnect switch for east transformer	-	30	YES	<0.005
2	W of 28	Transformer west of 28	PBV 3588-01	192	YES	<1.0
3	N of 24	NW beige/white transformer	C504860	1152	YES	7.6
3	N of 24	SE gray transformer	G852295B	205	YES	12
3	N of 24	Disconnect switch for SE gray transformer	-	30	YES	<1.0
3	N of 24	SW green transformer	5195402	312	YES	<1.0
4	E of 7 S of 15	Transformer	PBT 7447-01	183	YES	<1.0
6	SE side of 10	Transformer inside fence	G854306	205	YES	8.8
6	SE side of 10	Disconnect switch for transformer inside fence	-	30	YES	18
7	W of 9	Transformer in alley between 9 & 11	H885990	158	YES	8.8
7	W of 9	Disconnect switch for transformer H885990	-	30	YES	29.9
8	E of 11	Transformer in alley between 9 & 11	H884295	158	YES	13
8	E of 11	Disconnect switch for transformer H884295	-	30	YES	20
10	W of 7	North transformer	G852296	150	YES	13
10	W of 7	Disconnect switch for north transformer	-	30	YES	179
11	NE Corner of 7 & 8	West transformer	G852295A	205	YES	15
11	NE Corner of 7 & 8	Disconnect switch for west transformer	-	30	YES	280
12	NW of 33	REMOVED-East transformer on 2nd level	5041109	4	YES	<1.0
12	NW of 33	REMOVED-West transformer on 2nd level	N2312N37003	20 est.	YES	<1.0
12	NW of 33	REMOVED-East transformer	D546725-61P	40 est.	YES	316.1
12	NW of 33	REMOVED-West transformer	D525116-60P	40 est.	YES	744
12	NW of 33	REMOVED-Old transformer (out of service)	1211361	195	YES	6.2
14	E of 2A	Transformer in field	PAV 3589-01	176	YES	<1.0
15	NE end of 20	Transformer inside enclosure	G852295C	205	YES	13
15	NE end of 20	Disconnect switch for transformer G852295C	-	30	YES	225
15	NE end of 20	Transformer inside enclosure	H884372	205	YES	56
15	NE end of 20	Disconnect switch for transformer H884372	-	30	YES	13.3
16	N of 16	East transformer inside fenced area	SEV 0662-01	600	YES	<1.0
16	N of 16	West transformer inside fenced area	SDV 2985-01	859	YES	50
17	E of 7	North transformer 200' west of 13	H887854C	158	YES	28
17	E of 7	Disconnect switch for north transformer	-	30	YES	1.8
17	E of 7	South transformer 200' west of 13	H887885	158	YES	3
17	E of 7	Disconnect switch for south transformer	-	30	YES	4.7
18	SW corner of 17B	Transformer inside fenced area	H887853A	119	YES	16
18	SW corner of 17B	Disconnect switch for transformer H887853A	-	30	YES	1.5
22	NE of 22	East transformer	T38942	230	YES	1.7
22	NE of 22	West transformer	TAT70430101	769	YES	<1.0
26	N of 3	West transformer inside fenced area	H885287	217	YES	9.3
26	N of 3	Disconnect switch for west transformer	-	30	YES	3.3
30	W of 7	South transformer	H887853B	119	YES	17
30	W of 7	Disconnect switch for south transformer	-	30	YES	13
31	W of 110	Transformer inside fence	C651480 57P	278	YES	<2
37	NW of 37	Transformer in trees	No plate visible	100 est.	YES	<1.0
"	"	"	"	----	YES	3.1

**TABLE 4**  
**Summary of Transformers and Oil-Filled Equipment**  
**Site History Report - October 2004**  
Former Ingersoll-Rand Facility  
Phillipsburg, New Jersey

**Transformers (continued)**

Substation	Location	Description	S/N	Gallons Oil	Sampled?	Result (ppm)
15B	SE end of 20	Transformer inside enclosure	H887854B	158	YES	18
15B	SE end of 20	Disconnect switch for transformer H887854B	-	30	YES	6.9
15C	NE end of 20	Transformer inside enclosure - small one	J931664T71A	125	NO	NA
3B	S of 24 & 66	East transformer	5195401	598	YES	<1.0
3B	S of 24 & 66	West transformer	5195511	113	YES	<1.0
3B	SE corner of 24 & 66	Transformer	5205658	532	YES	<1.0
Main	Main substation	East transformer of NW pair	L252011	3700	YES	1.4
Main	Main substation	North transformer in SE pair	C505266	1380	YES	9.4
Main	Main substation	Load tap changer for east transformer	-	430	YES	5.3
Main	Main substation	South transformer in SE pair	C505267	1765	YES	5.3
Main	Main substation	West transformer of NW pair	G851087	3700	YES	2.5
Main	Main substation	Load tap changer for west transformer	-	430	YES	<1.0
Main	Main substation	Oil Circuit Breaker T124 Line - North "C"	-	90 est.	YES	<1.0
Main	Main substation	Oil Circuit Breaker T124 Line - Middle "B"	-	90 est.	YES	<1.0
Main	Main substation	Oil Circuit Breaker T124 Line - South "A"	-	90 est.	YES	<1.0
Main	Main substation	Oil Circuit Breaker Z26 Line - North "C"	-	90 est.	YES	<1.0
Main	Main substation	Oil Circuit Breaker Z26 Line - Middle "B"	-	90 est.	YES	<1.0
Main	Main substation	Oil Circuit Breaker Z26 Line - South "A"	-	90 est.	YES	<1.0
Main	Main substation	Control Power Transformer	-	75 est.	NO	NA
NA	Bldg. 10 - Receiving	REMOVED 3/7/00 - Four Pyranol Capacitors	-	4x1.3	NA	NA
NA	Bldg. 10 - Shipping	REMOVED 3/1/00 - Six Pyranol Capacitors	-	6x1.3	NA	NA
NA	Bldg. 11 - Betts Planer	REMOVED 3/3/00 - Three PCB Capacitors	-	3x1	NA	NA
NA	Bldg. 12 - Subway	Out-of-Service Oil Filled Switch	-	1	YES	ND
NA	Bldg. 24	REMOVED 3/10/00 - Seven PCB Capacitors	-	7x1	NA	NA
NA	By access road	Transformer on pole by access road to truck gate	A2312A25AAG	10 est.	YES	<1.0
NA	E of W retention pond	East transformer on pole	M7404454BRB	15 est.	YES	<1.0
NA	E of W retention pond	West transformer on pole	M740446YBRB	15 est.	YES	<1.0
NA	Inside E end of 13	Large transformer (in storage)	H360938P71AA	40 est.	YES	23
NA	Inside E end of 13	Large transformer (in storage)	H360937P17AA	40 est.	YES	22
NA	Inside E end of 13	Medium transformer (in storage)	No plate	15 est.	YES	39
NA	Inside E end of 13	Medium transformer (in storage)	A7752A25AA1	15 est.	YES	35
NA	Inside E end of 13	Medium transformer (in storage)	Damaged plate	15 est.	YES	39
NA	Inside E end of 13	Small transformer (in storage)	M263725YGNA	10 est.	YES	0
NA	N of 104	East transformer on pole	1643397	60 est.	YES	<1.0
NA	N of 104	West transformer on pole	1643393	60 est.	YES	<1.0
NA	N of Cameron	Transformer on pole	M12660894GNA	10 est.	YES	<1.0
NA	NW of 33	West transformer on pole	H360936P71AA	60 est.	YES	9
NA	NW of 33	South transformer on pole	N013944TESA	60 est.	YES	<1.0
NA	NW of 33	East transformer on pole	H360934P71AA	60 est.	YES	9.4
NA	SE of 1	North transformer on pole	H360933P71AA	60 est.	YES	10
NA	SE of 1	South transformer on pole	H360935P71AA	60 est.	YES	18
NA	SE of 22	Transformer on pole	77A042753	10 est.	YES	<1.0
NA	South of Bldg 20	Transformer for former building 5	69H17773	125 est.	YES	270
NA	SW of Entrance	Transformer on pole	63AJ4917	15 est.	YES	<1.0

**TABLE 4**  
**Summary of Transformers and Oil-Filled Equipment**  
**Site History Report - October 2004**  
Former Ingersoll-Rand Facility  
Phillipsburg, New Jersey

**CAPACITORS**

Substation	Location	Description of Equipment	Serial number	Bar-code	In Service	Date Disposed
NA	Bldg 11, Bay 7	Capacitor, North	6 02 189	C11.7	Yes	3/30/2003
NA	Bldg 11, Bay 7	Capacitor, Middle	6 02 185	C11.7	Yes	3/30/2003
NA	Bldg 11, Bay 7	Capacitor, South	6 02 035	C11.7	Yes	3/30/2003
NA	Bldg 28	Capacitor, N. Front	T7233	C28	Yes	3/30/2003
NA	Bldg 28	Capacitor, N. Back	7403239	C28	Yes	3/30/2003
NA	Bldg 28	Capacitor, M. Front	T5800	C28	Yes	3/30/2003
NA	Bldg 28	Capacitor, M. Back	T5784	C28	Yes	3/30/2003
NA	Bldg 28	Capacitor, S. Front	N77368	C28	Yes	3/30/2003
NA	Bldg 28	Capacitor, S. Back	T7227	C28	Yes	3/30/2003
NA	Bldg 28	Capacitor, Upper yell.	----	C28	Yes	3/30/2003

Total number of large low voltage PCB capacitors = 10

Total weight of PCBs in large low voltage capacitors = 13.60 kg

Total weight of PCBs from large low voltage capacitors in storage for disposal or shipped off site for disposal during the year = 13.60 kg

Total number of large low voltage PCB capacitors in service at the end of the year = 0

Total weight of PCBs from large low voltage capacitors remaining in service at the end of the year = 0 kg

Total number of PCB transformers = 0

Total weight of PCBs in transformers = 0 kg

Total weight of PCBs from transformers in storage for disposal or shipped off site for disposal during the year = 0 kg

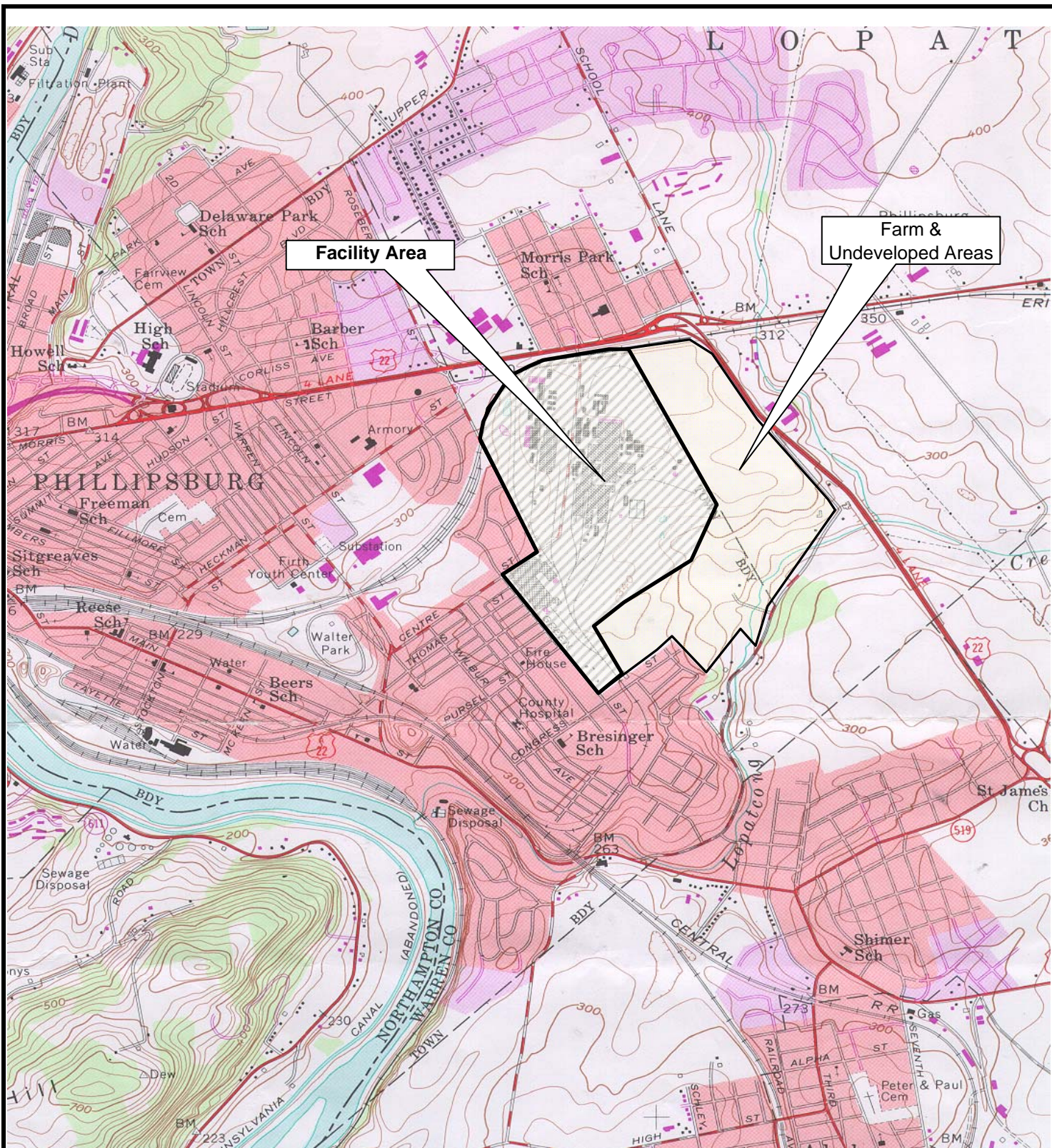
Total number of PCB transformers in service at the end of the year = 0

Total weight of PCBs from transformers remaining in service at the end of the year = 0 kg



## FIGURES





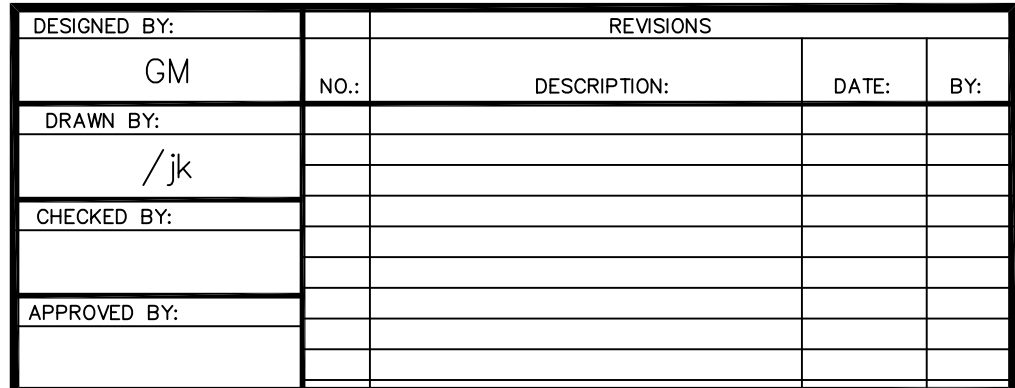
Note: Site boundaries are approximate.

<p><b>Source:</b> USGS 7.5' Topographic Quadrangle - Easton, NJ-PA 1954 - Photorevised 1981</p>	<p><b>Client:</b> Ingersoll Rand Company <b>Design/Review:</b> GM/CV <b>Scale:</b> 1:24,000 <b>Date:</b> 03/22/04</p>	<p><b>Figure Title:</b> <b>FIGURE 1</b> <b>USGS Site Location Map</b> Ingersoll-Rand - Phillipsburg, New Jersey <b>Project No.:</b> 03710-162</p>	<p><b>ENSR</b> INTERNATIONAL</p>
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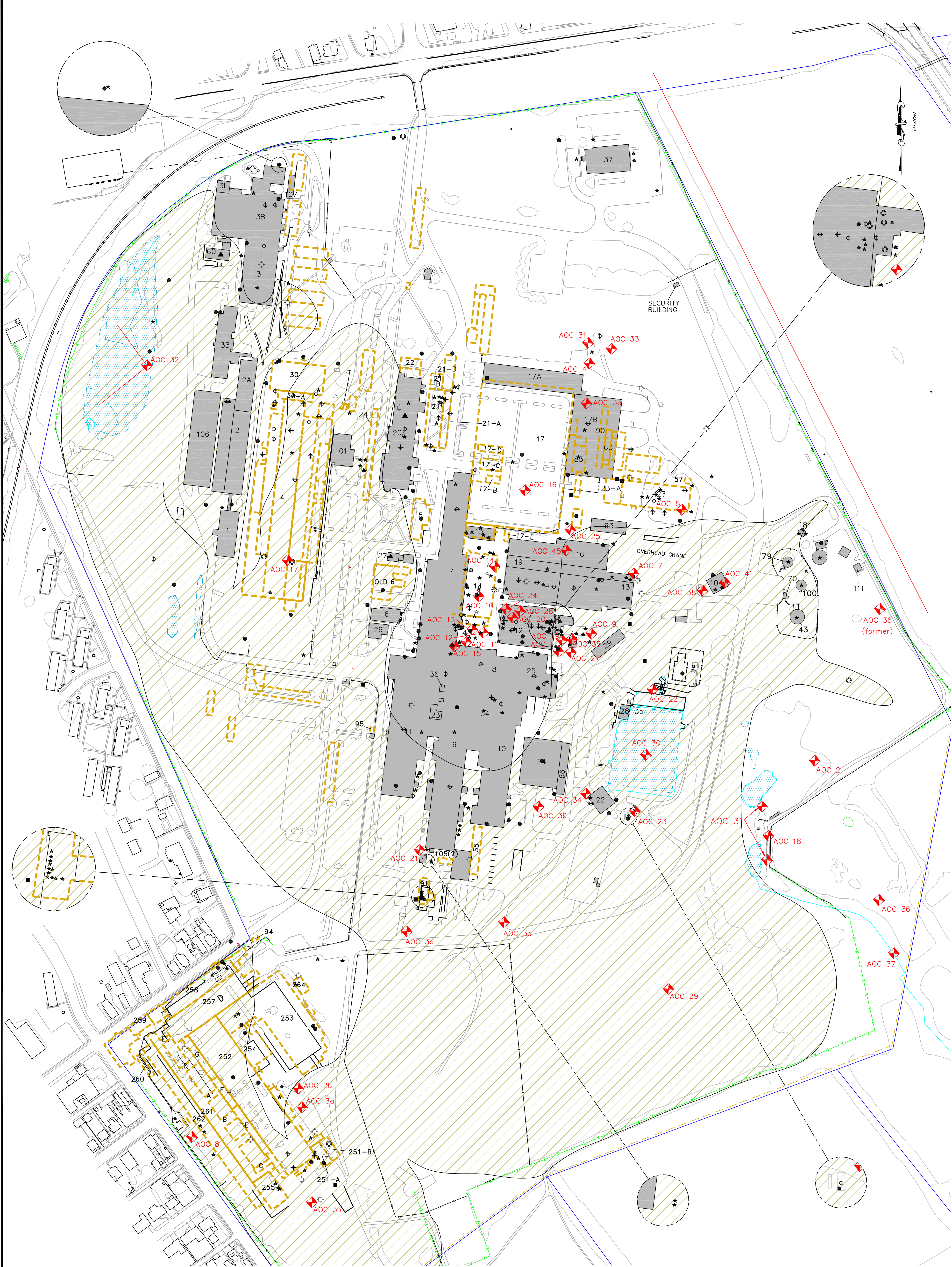
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SCALE:	DATE:	PROJECT NUMBER:
AS SHOWN	10/01/04	03710-162





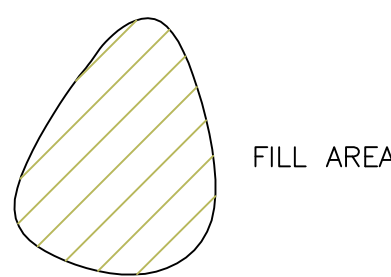


**Legend**

- SCRAP PADS, STORAGE AREAS, AND PROCESS AREAS
- FORMER PLATING LOCATION
- DRY WELL, SEPTIC, OR CESSPOOL LOCATION
- FORMER MINE LOCATION
- LOCATION OF AST AND/OR UST
- LOCATION OF ONSITE PONDS

- COAL STORAGE LOCATION
- TRANSFORMER LOCATION
- X-RAY EQUIPMENT LOCATION
- FORMER BOILERS, OVENS, FURNACES, AND INCINERATORS
- PREVIOUSLY IDENTIFIED AREA OF CONCERN (AOC)

- POND
- FENCE LINE
- BLOCK LIMITS
- PROPERTY BOUNDARY
- FORMER BUILDING FOOTPRINT



160 80 0 160  
Scale in Feet

**MAP OF AREAS OF CONCERN**  
INGERSOLL RAND COMPANY  
PHILLIPSBURG, NEW JERSEY

SCALE: AS SHOWN DATE: 10/07/04 PROJECT NUMBER: 03710-162



20 NEW ENGLAND AVENUE  
PISCATAWAY, NEW JERSEY 08854  
PHONE: (732) 981-0200  
FAX: (732) 981-0116  
WEB: HTTP://WWW.ENSRI.COM

DESIGNED BY:	REVISIONS			
	NO.	DESCRIPTION:	DATE:	BY:
X				
DRAWN BY:				
X				
CHECKED BY:				
APPROVED BY:				

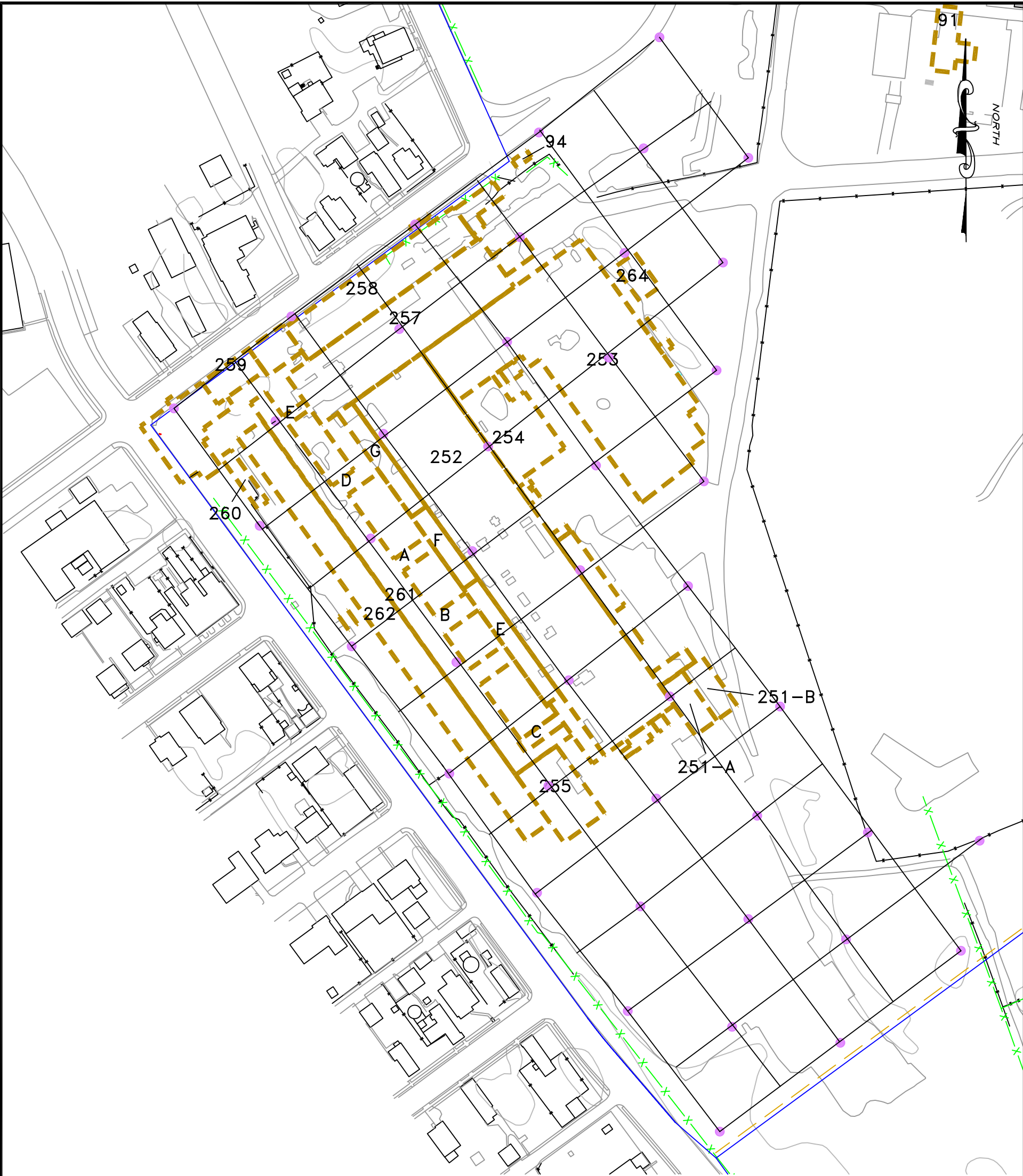
3

FIGURE NUMBER

SHEET NUMBER

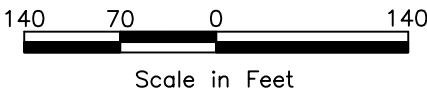
1 OF 1





Legend

- PROPOSED SAMPLING LOCATION
- x—x— FENCELINE
- — — BLOCK LIMITS
- — — PROPERTY BOUNDARY
- - - FORMER BUILDING FOOTPRINT



Scale in Feet

**PROPOSED GRID SAMPLING IN  
FORMER CAMERON AREA**

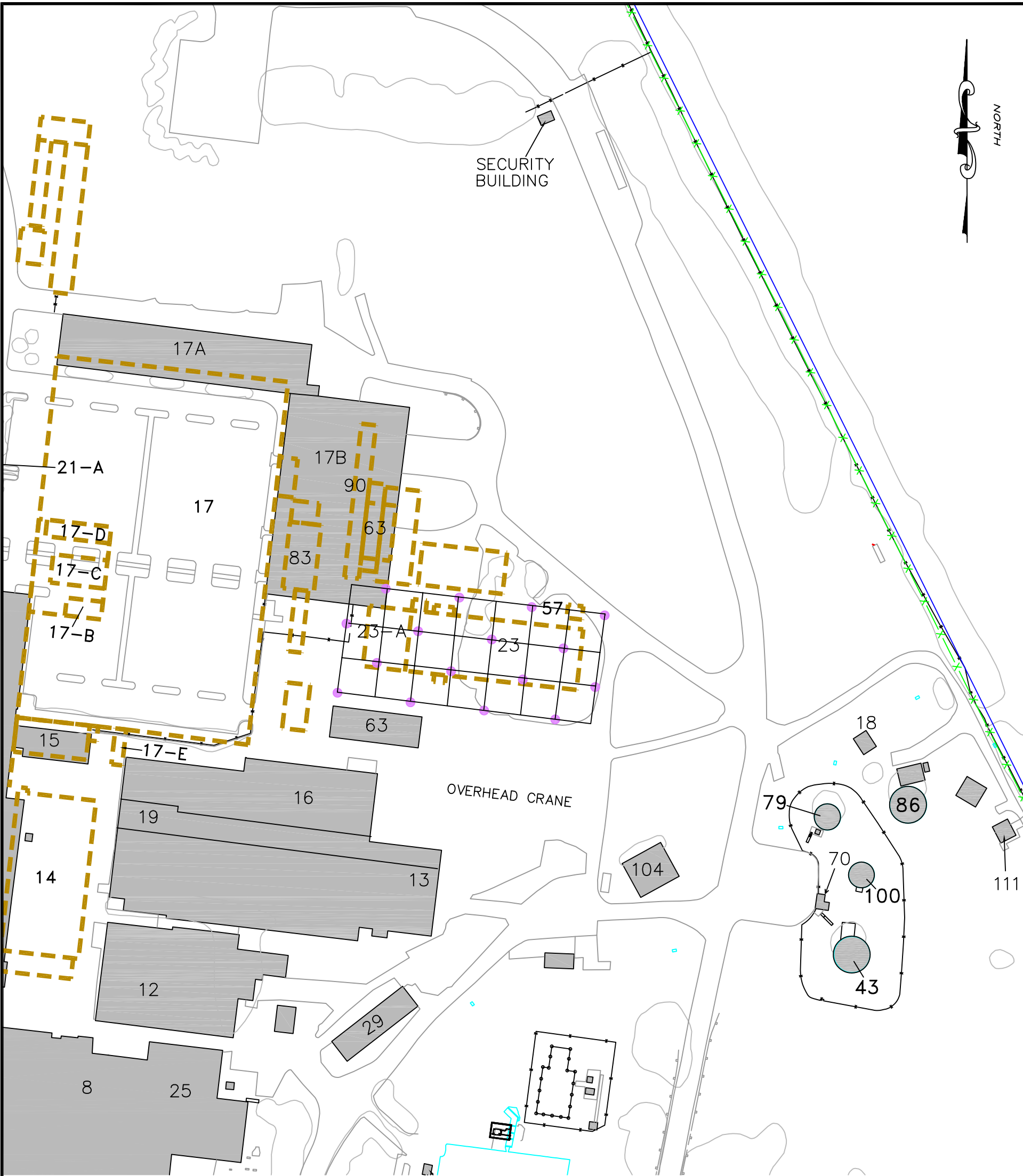
INGERSOLL RAND COMPANY  
PHILLIPSBURG, NEW JERSEY

SCALE:	DATE:	PROJECT NUMBER:
AS SHOWN	10/04/05	03710-162



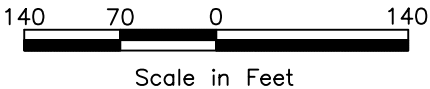
20 NEW ENGLAND AVENUE  
PISCATAWAY, NEW JERSEY 08854  
PHONE: (732) 981-0200  
FAX: (732) 981-0116  
WEB: HTTP://WWW.ENSUR.COM

DESIGNED BY:	REVISIONS			
GM/MB	NO.:	DESCRIPTION:	DATE:	BY:
DRAWN BY:				
/jk				
CHECKED BY:				
APPROVED BY:				



Legend

- PROPOSED SAMPLING LOCATION
- x — FENCELINE
- — BLOCK LIMITS
- — PROPERTY BOUNDARY
- - - FORMER BUILDING FOOTPRINT



J:\Project\Ingersoll Rand\03710-162\Cadd\Site History\PA\_Grid\_Samp\_Map.dwg

FIGURE NUMBER:		5
SHEET NUMBER:		
1 of 1		

PROPOSED GRID SAMPLING AT FORMER BUILDING #23		
INGERSOLL RAND COMPANY PHILLIPSBURG, NEW JERSEY		
SCALE: AS SHOWN	DATE: 10/04/05	PROJECT NUMBER: 03710-162



20 NEW ENGLAND AVENUE  
PISCATAWAY, NEW JERSEY 08854  
PHONE: (732) 981-0200  
FAX: (732) 981-0116  
WEB: HTTP://WWW.ENSUR.COM

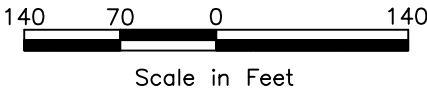
DESIGNED BY: GM/MB	REVISIONS			
DRAWN BY: /jk	NO.:	DESCRIPTION:	DATE:	BY:
CHECKED BY:				
APPROVED BY:				

NORTH



Legend

- PROPOSED SAMPLING LOCATION
- FENCELINE
- BLOCK LIMITS
- PROPERTY BOUNDARY
- FORMER BUILDING FOOTPRINT



Scale in Feet

PROPOSED GRID SAMPLING NEAR BUILDINGS #20, 21, 22 & 24

INGERSOLL RAND COMPANY  
PHILLIPSBURG, NEW JERSEY

SCALE:	DATE:	PROJECT NUMBER:
AS SHOWN	10/04/05	03710-162



20 NEW ENGLAND AVENUE  
PISCATAWAY, NEW JERSEY 08854  
PHONE: (732) 981-0200  
FAX: (732) 981-0116  
WEB: HTTP://WWW.ENSUR.COM

DESIGNED BY:	REVISIONS			
GM/MB	NO.:	DESCRIPTION:	DATE:	BY:
DRAWN BY:				
/jk				
CHECKED BY:				
APPROVED BY:				

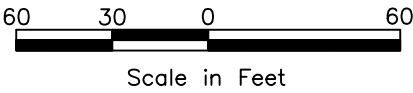


NORTH



Legend

- PROPOSED SAMPLING LOCATION
- x—x— FENCELINE
- BLOCK LIMITS
- PROPERTY BOUNDARY
- - - FORMER BUILDING FOOTPRINT



PROPOSED GRID SAMPLING  
NORTH OF FOUNDRY

INGERSOLL RAND COMPANY  
PHILLIPSBURG, NEW JERSEY

SCALE:	DATE:	PROJECT NUMBER:
AS SHOWN	10/04/05	03710-162



20 NEW ENGLAND AVENUE  
PISCATAWAY, NEW JERSEY 08854  
PHONE: (732) 981-0200  
FAX: (732) 981-0116  
WEB: HTTP://WWW.ENSUR.COM

DESIGNED BY:	REVISIONS			
GM/MB	NO.:	DESCRIPTION:	DATE:	BY:
DRAWN BY:				
/jk				
CHECKED BY:				
APPROVED BY:				

FIGURE NUMBER:

7

SHEET NUMBER:

1 of 1



## **APPENDIX A**

### **References**

**APPENDIX B**

**Aerial Photo Review**

**APPENDIX C**

**EDR Database Review**

## **APPENDIX D**

### **Sanborn® Fire Insurance Maps and Factory Insurance Maps**

## **APPENDIX E**

### **Environmental Remediation History**

## **APPENDIX F**

### **Summary of Site Ownership**

**APPENDIX G**

**Representative Site Maps**

**APPENDIX H**

**Building Summary**



**APPENDIX I**

**Summary of Disposal Practices**

## **APPENDIX J**

### **Summary of Wastewater Discharges**

## **APPENDIX K**

### **Summary of Environmental Permits**

## **APPENDIX L**

### **Description of Site Filling Activities**

**APPENDIX M**

**Summary of Potential AOCs**